June, 2002

DRAFT TERMS OF REFERENCE

CORTES ISLAND COASTAL PLAN FOR SHELLFISH AQUACULTURE

RATIONALE

Shellfish aquaculture has been a part of the resource use mosaic in the Cortes Island area for about 30 years. Biophysical capability studies of the waters and beaches conducted in the Plan area by the Ministry of Agriculture, Food and Fisheries indicate potential opportunities for further shellfish aquaculture development and shellfish growers would like to realize this potential.

The coastal landscapes of the Cortes Island area also provide visually attractive scenery and productive fish and wildlife habitat. Many upland property owners and residents in the Plan area have stated concerns about noise and visual impacts, loss of property values, resource use conflicts and uncertainty around carrying capacity of the area for shellfish aquaculture. Some members of the shellfish aquaculture industry have also stated a need for government to foster greater economic sustainability of the local industry.

The Regional District of Comox-Strathcona (CSRD) and the Cortes Island community have been instrumental in the creation of a Shellfish Aquaculture Planning Committee to address issues surrounding shellfish aquaculture. This committee is made up of people that represent a range of island interests. While this group has made some progress, it has had difficulty resolving planning, siting and regulatory issues without provincial involvement. The Regional District of Comox-Strathcona is also revising the zoning bylaw for the area.

The Cortes Island Coastal Plan for Shellfish Aquaculture (Cortes Island Coastal Plan) is designed to enhance sustainable development of the shellfish aquaculture industry, reinforce environmental values associated with industry operation and reduce conflicts between the shellfish growers and other coastal resource users, including adjacent upland property owners. This will be accomplished through a government-led process that will involve collaboration with the local community, tenure holders and interest groups in the area. Federal, First Nations and the RDCS governments will also be included in Plan development.

The Cortes Island Coastal Plan process will deliver a Coastal Plan specific to shellfish aquaculture issues by end of March 2003. A major goal of this planning process is to resolve future conflicts between other resource uses and shellfish aquaculture industrial use of the foreshore. The Plan will also guide tenuring and management of the shellfish aquaculture industry in the foreshore and nearshore areas, contribute to the Ministry's goal of increasing Crown land tenure decision making efficiency, and, where possible, identify sustainable* development opportunities for shellfish aquaculture. This Planning process is not intended to develop a community Plan but may provide information for future community planning process (e.g. current RDCS zoning review).

PLAN PURPOSE AND SCOPE

The primary purpose of the Cortes Island Coastal Plan is to address conflicts between the shellfish aquaculture industry and other resource users through a plan that will guide the management and allocation of marine lands, including intertidal areas for shellfish aquaculture. Where possible, the planning process will make recommendations regarding ways to enhance the economic sustainability of the local industry.

The Plan will not direct management of private lands and First Nation Reserves, but may identify where marine environmental quality or areas normally suitable for shellfish culture are affected by upland activities or where shellfish aquaculture development is or would be affecting upland activities. The Plan is intended to consider the views and interests of the local and First Nations communities and other interested parties in guiding the long-term sustainable use of the coastal land and resources by the shellfish aquaculture industry in the Cortes Island area.

Located at the northern end of the Strait of Georgia, Cortes Island is bounded by Lewis Channel on the East and Sutil Channel on the West. The Plan area includes the Crown foreshore and near-shore areas surrounding Cortes Island as well as Marina Island and the Twin Islands (See Map1).

Both the Klahoose and Sliammon First Nations have traditional territory within the Plan area. The Plan will not limit any treaty discussions that occur within the Plan area. The Plan does not affect Federal and Provincial Legislation (e.g. Provincial Parks). The Plan recognizes the role of the RDCS in regional planning. Although the Plan may make comments regarding upland activities, it will not take the place of land use planning undertaken by other jurisdictions, such as the Regional District or First Nations.

Concurrent to the Cortes Island Coastal Plan process, the province is implementing a compliance and enforcement program in a number of areas of the province, including Cortes Island, and is developing an enforceable provincial code of practice (standards of operation) for the shellfish aquaculture industry. These exercises will help inform the planning process.

1. The Plan will identify key attributes, existing uses and activities and management areas for shellfish aquaculture, including recommendations where applications for shellfish aquaculture would be acceptable.

2. The Plan will be used by provincial tenuring agencies to guide future allocation and use of Crown foreshore and nearshore areas for shellfish aquaculture.

3. Where feasible the Plan will identify localised areas for shellfish aquaculture economic development opportunity.

4. The Plan may identify where critical marine habitat and marine sensitive areas warrant additional consideration and study in terms of their acceptability for shellfish aquaculture.

* *Sustainable means socially, economically and environmentally sustainable*

5. To enhance economic development opportunities, the Plan may address potential co-operative management arrangements with First Nations, local government and small businesses for the administration, management and uses of foreshore and nearshore land for shellfish aquaculture.

The table of contents suggested on page 6 provides a general outline of the products that are anticipated by the Action Planning process.

THE PLANNING PROCESS

Two Public Open Houses will be held on Cortes Island, one at the beginning of the Planning process and one at the end. The first will be to present information and answer questions about the process and the second to present and answer questions on draft Plan products and solicit feedback for Plan editing. Individual stakeholders, such as aquaculture and tourism associations, will be contacted by the Province and will be maintained on a mailing list to update participants on the Plan and process.

STAKEHOLDER PARTICIPATION

The following list of stakeholders, government agencies and industry has been initially developed as a basis for participation and feedback on the Cortes Island Coastal Plan for Shellfish Aquaculture. Throughout the Planning process, additional organisations or associations may be included as required.

Friends of the Gorge
Friends of Cortes Island
Cortes Island Seafood Association
Area B Clam Management Advisory Committee
Council of BC Yacht Clubs
Coastal Tourism Operators Association
Cortes Island Shellfish Co-operative
Alliance for Responsible Shellfish Harvesting
Sea Kayak Groups and Companies
BC Wildlife Federation
BC Shellfish Growers Association
BC Salmon Farmers Association
Forest Companies
Harbour Authority
Marine Operators Association
Council of Marine Carriers
United Fishermen and Allied Workers Union
Fishing Vessel Owners Association
Underwater Harvesters
Commercial Fishers (draggers and shrimp fishers)

The existing Cortes Island Shellfish Aquaculture committee established by the Regional District and which includes Klahoose First Nations representation may function as a local advisory body to assist in obtaining public and community feedback (see flow chart).

PROJECT MANAGEMENT

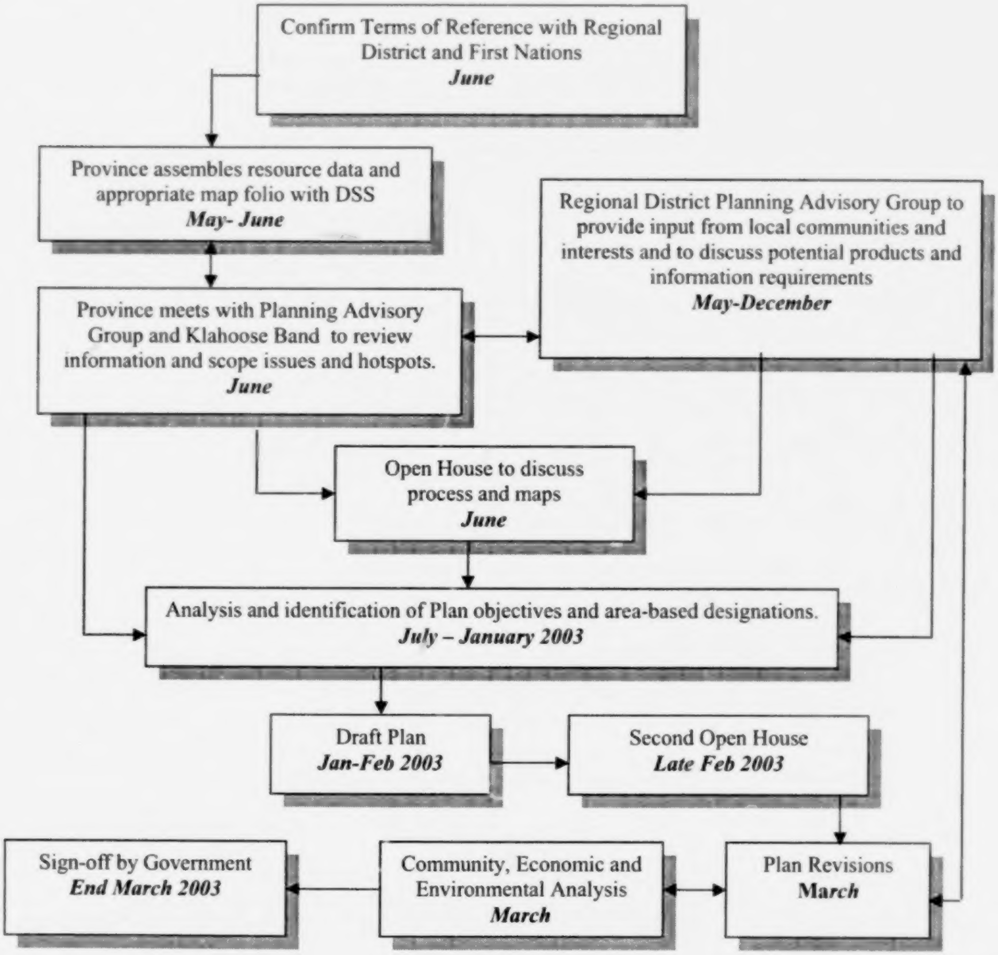
The Cortes Island Coastal Plan project will be jointly managed by the Coast Region and the Coast and Marine Planning Branch, and supported by Decision Support Services Division of the Ministry of Sustainable Resource Management. The Department of Fisheries and Oceans will provide advice to the Plan and the RDCS and First Nations will play a collaborative role in development of the Plan.

Other government agencies expected to participate at key points throughout the process include:

- Land and Water BC (formerly BC Assets and Lands Corporation);
- Ministry of Agriculture, Food and Fisheries;
- Ministry of Water Land and Air Protection;
- Department of Fisheries and Oceans (includes input from Canadian Coast Guard);
- Canadian Wildlife Service;

The Ministry of Sustainable Resource Management will approve the final Plan.

PLAN PROCESS


Confirm Terms of Reference with Regional District and First Nations *June*
Province assembles resource data and appropriate map folio with DSS *May- June*
Regional District Planning Advisory Group to provide input from local communities and interests and to discuss potential products and information requirements *May-December*
Province meets with Planning Advisory Group and Klahoose Band to review information and scope issues and hotspots. *June*
Open House to discuss process and maps *June*
Analysis and identification of Plan objectives and area-based designations. *July – January 2003*
Draft Plan *Jan-Feb 2003*
Second Open House *Late Feb 2003*
Sign-off by Government *End March 2003*
Community, Economic and Environmental Analysis *March*
Plan Revisions *March*

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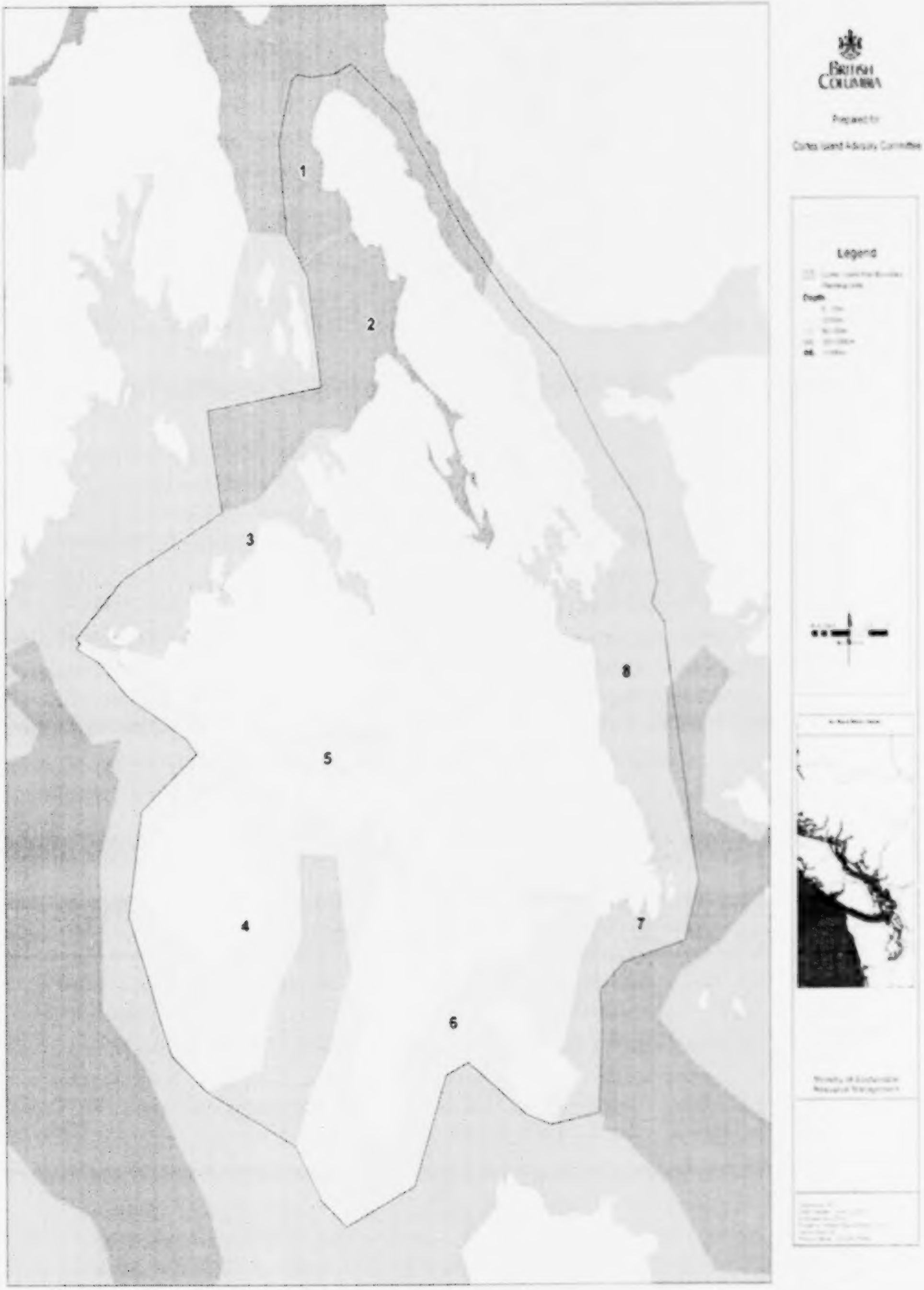
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Prepared for
Cortes Island Advisory Committee
Legend
Depth
Ministry of Sustainable Resource Management

The Terms of Reference for the Cortes Island Coastal Plan are approved by the undersigned.

Eamer

Date: June 5/02

APPROVED
Wally Eamer, Director
Coast Region
Ministry of Sustainable Resource Management

John Bones

Date: June 5/02

APPROVED
John Bones, Director
Coast and Marine Planning Office
Ministry of Sustainable Resource Management

David

Date: June 5/02

APPROVED
David Johns, Assistant Deputy Minister
Resource Management Division
Ministry of Sustainable Resource Management

Cortes Island Coastal Plan

for Shellfish Aquaculture

July 2003

Ministry of
Sustainable Resource Management
Coast & Marine Planning Branch

British Columbia

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BRITISH
COLUMBIA

Reference: 33780

Dear Reader:

As Minister of Sustainable Resource Management and Minister responsible for Land and Water British Columbia Inc. (LWBC), it is my pleasure to approve the Cortes Island Coastal Plan for Shellfish Aquaculture.

This Plan has been prepared in accordance with provincial jurisdiction over coastal and foreshore areas of British Columbia's coast. It is intended to assist LWBC and other provincial agencies when considering applications for shellfish tenure. It also assists the local community and First Nations by identifying opportunities for future development, including conservation and recreation areas, and by improving management of existing shellfish tenures. It will prove a useful tool for individual development proponents, including local entrepreneurs, by identifying in advance the opportunities, constraints and limitations to various types of shellfish aquaculture uses on Crown foreshore and nearshore on and around Cortes Island. An important prerequisite for any new off-bottom facilities to be developed in Gorge Harbour is that outstanding compliance and enforcement issues are appropriately addressed. In addition, operators will be required to comply with enforceable provisions in the Provincial Code of Practice."

I am pleased to note that Plan development has benefited from participation by First Nations and the Regional District of Comox Strathcona.

This Plan will be subject to follow-up and future amendment, in accordance with changing circumstances and new information.

Yours truly,

Stanley B. Hagen
Minister

Ministry of
Sustainable Resource
Management

Office of the Minister

Mailing Address:
PO Box 9054 Stn Prov Govt
Victoria BC V8W 9E2

Location:
Parliament Buildings, Victoria

Acknowledgements

The Cortes Island Coastal Plan for Shellfish Aquaculture was shaped by the advice and kind support of many individuals. Special thanks are extended to the Regional District of Comox Strathcona for providing technical advice and comment on the Plan throughout its preparation, in particular George Sirk, (Director, Area I) and Gerard LeBlanc (Manager of Planning). The Plan has benefited from hard work, insight and advice from a Plan advisory committee, set up by the Regional District and composed of the following local community members: Myrna Kerr (Chair), Lorena Teames, Ruth Zwickel, Annabelle Herbert, Delia Becker, Helen Radosevic, Ruth Riddell, Fred Picard, Hubert Havelaar, Cec Robinson, Glen Carleton, Barbara M^cGinn, Michael Gibbons, Dave Nikleva and Katrina Pielle.

The Plan also benefited significantly from the participation of the Klahoose and Sliammon First Nations, particularly Chief Councilor Ray Noble (Klahoose) and Councilor Denise Smith (Sliammon).

Several provincial and federal government staff made important contributions to the Plan. Thanks are extended to Barron Carswell, Bill Harrower, Jim Russell, Yves Anataya and Jaclyn Hunter (MAFF), David Cruickshank (Regional Office, MSRM), Duncan Williams and Neil Banera (LWBC), Judy Davis (WLAP, Nanaimo), Barry Miller (MOF, Powell River), Patti Menning (FOC, Campbell River), Kerry Marcus (FOC, Nanaimo), Ken Brock, (CWS, Vancouver), Blaire Holmes (Environment Canada, Vancouver), Jim Naylor (CCG, Vancouver).

The Plan was prepared by Joe Truscott (Project Manager), John Bones, Chad Egan, Graham Winterbottom, and Rob Paynter (CMPB, Victoria) with technical and mapping support from Rick Deegan (MSRM, Decision Support Services). Consulting assistance was provided by Gary Robinson (socio-economic description) and by Coastal and Oceans Resources Inc. and Archipelago Marine Research (environmental description).

Acronyms and Definitions

BCFC: British Columbia Ferry Corporation

CFIA: Canadian Food Inspection Agency

CMPB: Coast and Marine Planning Branch, MSRM

CWS: Canadian Wildlife Service, Environment Canada

FOC: Fisheries and Oceans Canada (also referred to as DFO)

FPPA: *Farm Practices Protection* (Right to Farm) *Act*

LWBC: Land and Water British Columbia Inc.

MAFF: Provincial Ministry of Agriculture, Food and Fisheries

MOF: Provincial Ministry of Forests

MSRM: Provincial Ministry of Sustainable Resource Management.

MWLAP: Provincial Ministry of Water, Land and Air Protection.

RDCS: Regional District of Comox-Strathcona.

SFU: Simon Fraser University

UREP: A *Land Act* reserve or notation of interest established for the "use, recreation and enjoyment of the public."

Adaptive Management: Adaptive management involves specific allocation and management prescriptions in the face of uncertainty, monitoring the results of those prescriptions and then revising management approaches accordingly.

Beach Culture: Culture of shellfish in or on the beach in the intertidal area between high and low tide. For example, oyster culture is on the beach and in the case of clam culture the animals live in the substrate under the beach surface.

Benthic: Pertaining to the seabed or bottom.

Biophysical Capability: The likelihood of an area's biological, physical or oceanographic attributes to successfully accommodate the growing or cultivation of shellfish for commercial purposes, using standard methods and equipment. The highest rating is "Good" and a "Medium" rating is deemed as being acceptable for culture.

Blue Listed Species: Any indigenous species or subspecies considered to be vulnerable in British Columbia.

Extensive Aquaculture: The growing of Plants and animals in natural waters with no supplemental feed. A term normally applied to shellfish culture.

Farm Gate Value: The price paid to farmers for product delivered to the processing Plant.

Foreshore (intertidal) area: the area between the mean high tide and low tide mark (i.e. below zero tide).

Intensive Aquaculture: The growing of Plants and animals in natural or man-made containers of water with feed supplementation or enrichment. A term normally applied to finfish culture.

Invertebrates: Includes red and green urchins, octopus, crab, prawn, shrimp, sea cucumbers and other shellfish such as clams, oysters, scallops and geoducks.

***Land Act* Notation of Interest:** A notation on LWBC reference maps of an interest in an area of Crown land by another government agency. It ensures an initial referral to agencies whose particular mandate, programs or interests may be affected by the issuance of a tenure, and provides the opportunity for the affected agency to identify priority issues, concerns or conditions. It may be used over the areas where further planning is contemplated. It does not preclude the acceptance of land applications.

***Land Act* Reserve:** A reserve established on LWBC reference maps to temporarily withdraw Crown land from disposition by tenure. A reserve is placed over an area to enable other agencies to undertake planning, to provide temporary protection or to maintain options for future use.

Marine Protected Area (MPA): A marine protected area may be established under a variety of provincial and federal government statutes, either as a temporary or permanent area for the conservation or protection of important biological, recreational and cultural features or values. An MPA may include a provincial Marine Park, Ecological Reserve, Wildlife Management Area, federal National Marine Conservation Area under the *National Marine Conservation Act*, fishery closure under the federal *Fisheries Act*, or a Marine Protected Area under the *Canada Oceans Act*.

Management Conditions: Conditions that must be fulfilled by applicants before LWBC will consider accepting tenure and License applications in areas where shellfish aquaculture is deemed "Conditionally Acceptable",.

Management Guidelines: Provisions, based on issues, conflicts and concerns identified for each Planning Unit to guide the siting, management and operation of shellfish aquaculture facilities. These can be applied to areas where applications are considered "Acceptable" or 'Conditionally Acceptable".

Near shore area: The sub-tidal area below low tide mark, generally extending to the 20 metre bathymetric depth.

Off-bottom culture: Culture of shellfish such as oysters and scallops in deeper water offshore of the low tide mark using floating structures such as rafts or longlines.

Offshore area: the sub-tidal area seaward of the 20 metre bathymetric depth.

Red Listed Species: Includes any indigenous species or subspecies that have, or are candidates, for status as extirpated, endangered, or threatened species in British Columbia

Risk: Risk is unavoidable and present in virtually every human situation and has many acceptable definitions, all with the common theme of uncertainty of outcomes. Here, "risk" refers to the uncertainty that surrounds future events and outcomes. It is the expression of the likelihood (i.e. probability) of a negative effect (i.e. hazard) occurring. Although risk is quantifiable in some cases, frequently professional judgement and experience are used to assess whether risk is high, moderate or low.

Risk Averse: A strong aversion to (or tendency to avoid) a policy or decision that involves risk.

Sanitary Shellfish Closure: FOC closure of an area to shellfish harvesting due to bacterial contamination. This applies to harvest of wild and cultured shellfish.

Shellfish Aquaculture: The growing of shellfish under controlled conditions.

Sub-tidal culture: Culture of shellfish in areas below low tide where the culture is subsurface with no surface floats or structures (e.g., geoduck culture takes place on the seabed in sub-tidal areas).

Suitability: The determination of whether or not a particular use of activity is appropriate for a given area, based on inherent biological and physical capability and a variety of additional policy, social preference and siting factors, including compatibility with adjacent uses.

Sustainability: The optimization of economic development is a manner that maintains ecosystem integrity and enhances the well-being of existing and future generations.

Upland: the terrestrial area extending approximately 200 meters inland from the highest tide line.

Vancouver Island Summary Land Use Plan (VILUP): The 2000 Vancouver Island Summary Land Use Plan, completed in 2000, is a consolidation of the Province's 1994 Vancouver Island Land Use Plan and subsequent implementation reports.

1.0 Introduction

1.1 Location

The Plan Area is located in the Northern Strait of Georgia, east of Vancouver and Quadra Islands and west of West Redonda Island and Desolation Sound (Figure 1). The Plan Area includes all nearshore waters, shoreline and intertidal areas within the Plan Area up to the high tide mark.

The Plan Area lies within the traditional territory of the Klahoose, Sliammon and Homalco First Nations and within the Statement of Intent area of the Hamatla Treaty Society. It is within the administrative boundaries of the Regional District of Comox Strathcona, Electoral Area "I".

The Plan Area includes Marina and Twin Islands and the waters surrounding Cortes Island, including Lewis Channel, Sutil Channel and Baker Passage. The Plan Area does not include land or waters within adjacent Provincial Parks such as Von Donop Inlet Provincial Park.

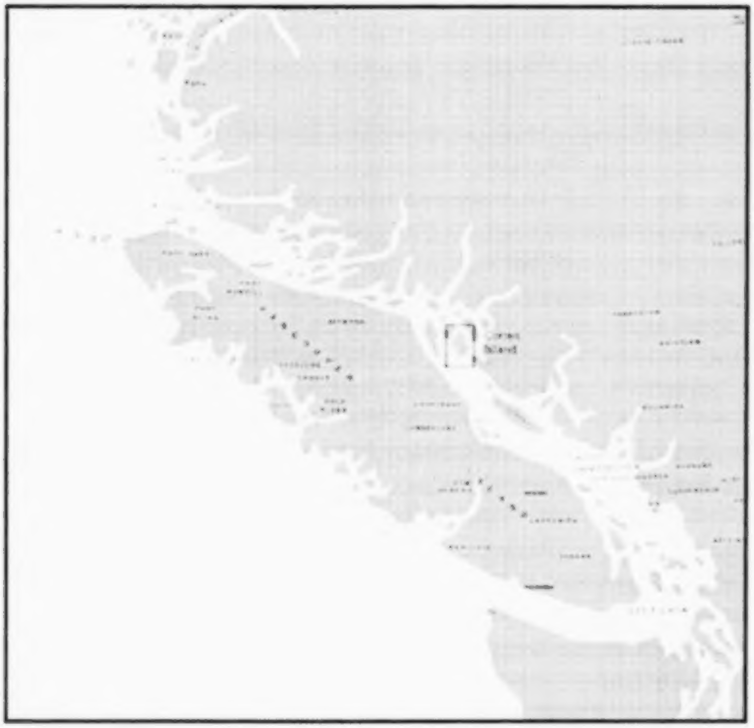

Figure 1. Cortes Island, Regional Setting

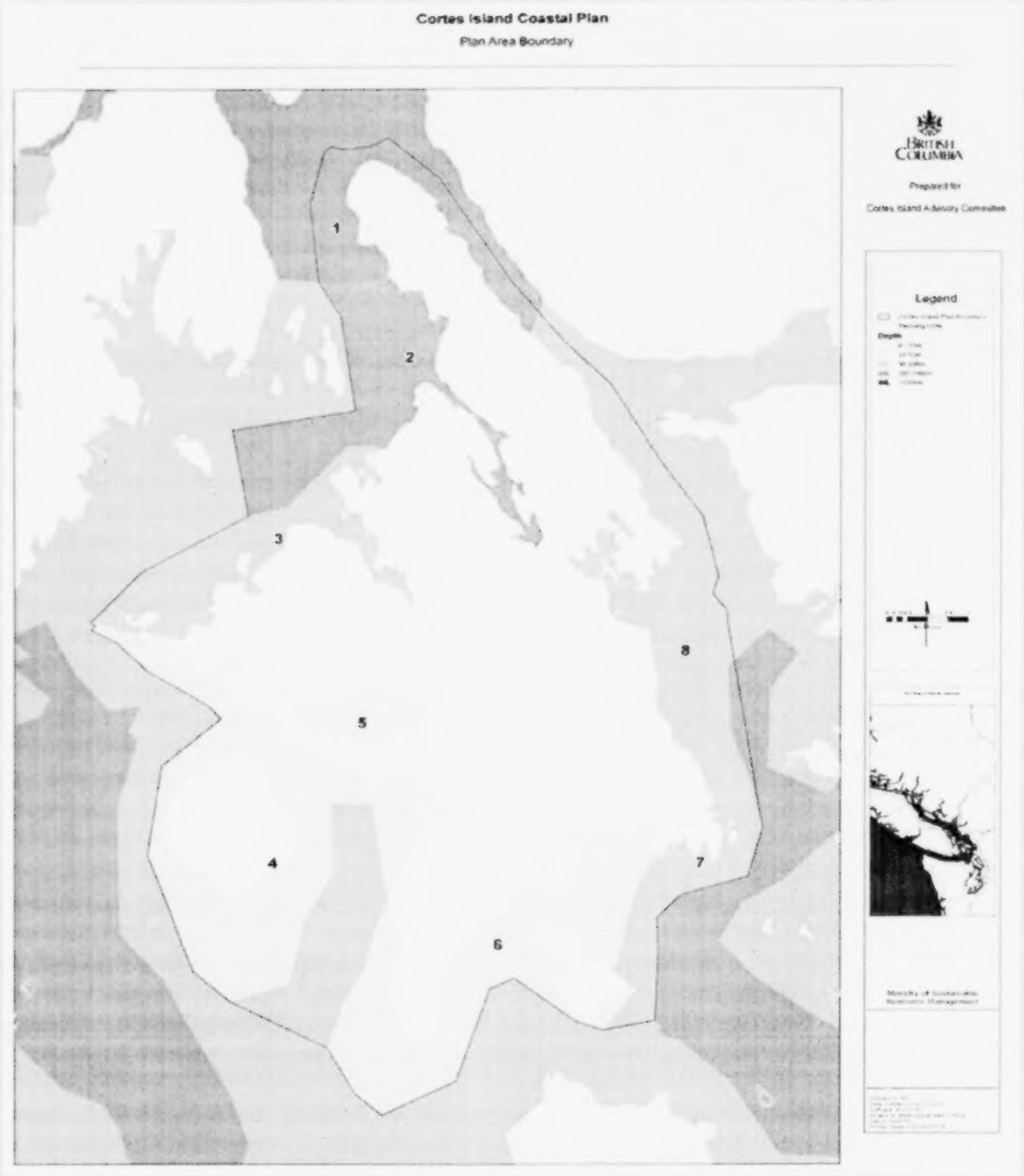
Cortes Island Coastal Plan
Plan Area Boundary
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Figure 2. Cortes Island Plan Area

1.2 Plan Rationale and Intent

The Cortes Island Plan Area supports a range of economic activities that include commercial fisheries, log handling and storage, marine transportation, public recreation, tourism, commercial recreation and shellfish aquaculture. It contains an array of sensitive resources and cultural values that are important to the Cortes Island community as well as surrounding communities. Several First Nations have traditionally used the Cortes Island area for centuries and the use and health of its resources remain vital to their cultural and economic well-being. These values and issues were reflected in the Vancouver Island Summary Land Use Plan (2000) which included the Cortes Coastal Plan Area as a high priority for planning due to potential for conflict. More recently, members of the Cortes community have become highly vocal about these conflicts, particularly involving operation and growth of shellfish aquaculture.

The Cortes Island Coastal Plan is designed primarily to address the specific issue of resource use conflict at the community level between shellfish aquaculture and other uses and provides the basis for shellfish aquaculture development on an environmentally sustainable basis. The Plan places some emphasis on Gorge Harbour, given an escalation of conflicts there in recent years.

The Plan is intended to guide decisions on land tenure applications for new or expanded shellfish aquaculture development, inform related local government zoning and clarify the provincial and local government mechanisms to address issues with the existing industry. It also attempts to respect and accommodate the interests and traditional uses of First Nations, while reinforcing participation of First Nations in economic activities.

The Plan employs a transparent and science-based approach to: 1) identify whether or not additional area should be provided for expansion or new shellfish aquaculture development; 2) document what tools are available to address issues associated with existing shellfish aquaculture operations; and 3) provide management direction for shellfish aquaculture in the Plan Area. This Plan is consistent with the MSRM governance principles for sustainability, presented in (Appendix 1).

1.3 Jurisdiction and Scope

Jurisdiction[1] in the coastal zone is complicated by the relationship between land (including seabed) ownership and legislative authority over resources. There is a common public misconception that the Province has no jurisdiction or role in coastal management, due to federal government authority over fisheries management, marine mammal management, migratory birds, and marine transportation and safety, and the high profile of these issues in coastal communities.

The Province, however, is an important land owner in the coastal zone. The Province owns the foreshore (intertidal) areas of its coastline. In addition, the Province owns coastal "inland waters", or waters "within the jaws of the land" (intra fauces terrae), and the lands covered by these waters. Inland waters are waters within an indented coastline, such as harbours, bays and estuaries, including areas between headlands along the outer coast. The Supreme Court of Canada, in a 1984 decision, also confirmed the Province's ownership of the waters and the lands, minerals and other natural resources of the seabed and subsoil in the Georgia, Juan de Fuca, Johnstone and Queen Charlotte Straits. Thus, many sub-tidal areas are also owned by the Province.

Offshore areas along British Columbia's western coastline from the low water mark, or from the boundaries of inland waters, seaward to the territorial limit are owned by the federal government.

Accordingly, the Province's ownership and legislative jurisdiction over such matters as the management of provincially owned public lands provide the rationale for provincial coastal planning, park and ecological reserve establishment, and tenure of coastal foreshore and inland waters.

Land and Water BC Inc. (LWBC) allocates and administers the use of provincially-owned aquatic lands through tenures for aquaculture and many other activities. In addition, the Ministry of Agriculture, Food and Fisheries (MAFF) approves and regulates aquaculture operations through Aquaculture Licences and associated Shellfish Aquaculture Management Plans under the *Fisheries Act*. The Ministry of Water, Land and Air Protection (WLAP) is tasked with waste management under the *Waste Management Act* and wildlife habitat protection under the *Wildlife Act*.

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[1] This overview is neither a legal interpretation, nor a position statement of the Province of British Columbia; nor does it address First Nations' rights and title issues.

Fisheries and Oceans Canada (FOC) manages fisheries and navigational safety under the *Fisheries Act* and *Navigable Waters Protection Act*, respectively, and the environmental assessment of development proposals under the *Canadian Environmental Assessment Act* and the *Fisheries Act*. The Canadian Wildlife Service of Environment Canada is responsible for the protection of migratory birds under the *Wildlife Act* and *Migratory Birds Convention Act*. Environment Canada also monitors water quality and documenting pollution sources as they relates to shellfish sanitation and provides the information that FOC uses to classify shellfish growing areas (e.g. approved, closed, etc.). The Canadian Food Inspection Agency (CFIA) is responsible for plant certification and the monitoring of paralytic shellfish poisoning (red tide levels) in marine waters. All of these federal and provincial agencies are responsible for enforcement under their regulatory mandates.

Local governments, such as RDCS and private property owners also influence coastal management activity through official community plans, zoning by-laws, regulations and development requirements, and upland owner riparian rights. In addition, First Nations have legally established Aboriginal rights that may be potentially affected by coastal developments, and which must therefore be taken into account by the provincial government in the decision making process for foreshore and nearshore use applications. Provincial consultation policies reflect recent court decisions and require provincial agencies to seek to accommodate First Nations interests in land use decision making processes.

The Klahoose, Sliammon, Homalco and Hamatla Treaty Society First Nations (including Campbell River, Cape Mudge and Comox First Nations) are in the treaty negotiation process with the provincial and federal governments. These First Nations have made claims of rights and title over land and waters in the Plan Area.

This Plan does not make recommendations regarding use of private land, federal land, or Indian Reserves. Its recommendations are not intended to limit any treaty negotiations or settlements that may occur respecting foreshore and nearshore rights, ownership or uses. Its recommendations are also not intended to alter or interfere with provincial legislation or local area by-laws; although it is preferred that local government Plans will be consistent with this Plan.

This Plan provides recommendations for areas where shellfish aquaculture applications to the Province would be acceptable in the foreshore and nearshore. There are separate federal and provincial application and referral processes for shellfish aquaculture. While the Plan addresses shellfish aquaculture it also takes into account recreation, conservation, upland landowner concerns and other values with respect to considering shellfish aquaculture tenure opportunities. The Plan does not replace the tenure referral process of LWBC or the environmental review process of FOC nor does it imply that applications in areas identified as acceptable for shellfish aquaculture will be approved by either agency after the referral process is completed.

1.4 Current Situation

Several areas around the Island, including Gorge Harbour, have "Good" (i.e. the highest rating) or "Medium" (i.e. very acceptable) biophysical capability for shellfish aquaculture, as measured for Japanese oysters, Manila clams and Pacific scallops. This is reflected by many existing shellfish aquaculture sites primarily for oysters on beaches and on rafts, but also clams, mussels and some scallop culture in the north part of the Plan Area (see Section 2.4 for production figures and Section 3.8 for Planning Unit maps and site locations). Sub-tidal culture of geoducks is practiced at the south end of Marina Island and has good potential around the Island for further development, although it is currently a fledgling industry in BC. Outside of Gorge Harbour, off-bottom culture potential is likely to be restricted to only a few localized areas, due to wave exposure. Most of the areas with biophysical capability for beach culture of shellfish in Gorge Harbour are currently occupied by tenures, thereby leaving little opportunity for further expansion of beach culture. However, based on biophysical capability alone, there appears to be additional potential for off-bottom culture in Gorge Harbour.

As a result, Cortes Island has come to be regarded as a provincially significant area for shellfish aquaculture. In recent years there has been particular interest in Gorge Harbour for shellfish aquaculture development due to its combination of good biophysical capability, proximity to infrastructure and relatively sheltered waters. In the Harbour, shellfish beach culture was introduced prior to 1985 and the first rudimentary off-bottom operation with rafts around 1985-86. Today, the Plan Area supports 45 beach tenures, 12 off-bottom tenures, three combined beach and off-bottom tenures and two sub-tidal (geoduck) tenures. The largest combined tenured area for shellfish culture in the Plan Area is in the Marina Island Planning Unit with 17 beach tenures occupying 33.31 hectares. Gorge Harbour, which, by far, is the smallest Planning Unit, has the largest concentration of tenures in the Plan Area, with 15 beach tenures occupying 16.44 hectares and 7 off-bottom tenures occupying 13.25 hectares. The latter figure comprises more than half of the 20.12 hectares occupied by off-bottom tenures in the Plan Area.

Other key values and interests in the Plan Area include ecological, residential, visual, tourism and recreational values and most proponents of these values emphasize the need for a rural setting with minimal industrial development. The Island supports existing tourism and ecotourism industries with potential for future growth of these sectors. Cortes Island is valued for rich, and in some cases, unique biological and ecological values, such as the richly productive reef systems that are found in Planning Units 4 and 6. The area has also supported a concentration of year-round and seasonal residences, cottages and retirement homes for many years. Local knowledge indicates that the majority of dwellings in Gorge Harbour have been there for over 25 years.

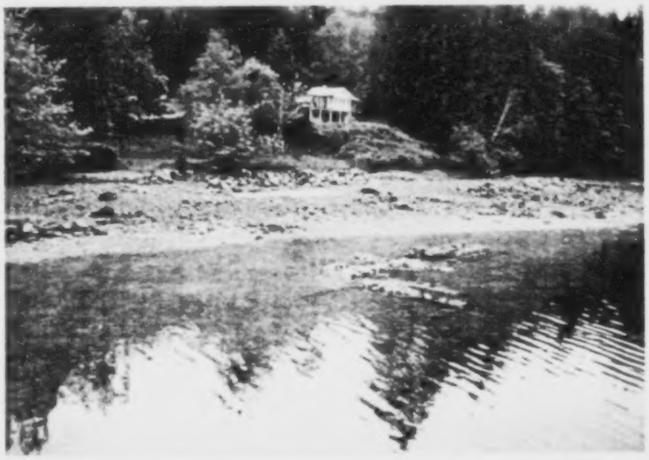

Figure 3. Intertidal Beach Culture and Upland Residence (Chad Egan photo).

Shellfish growers generally regard shellfish culture as an environmentally sustainable industry that offers many positive environmental and social benefits and that can blend well within the mosaic of varied coastal uses. Many Island residents are directly associated with, and support, the industry. The industry has indicated that lack of access in recent years to sites in uniquely ideal areas culture like Gorge Harbour has impeded economic development of the industry and the community.

Cortes Islanders, whether directly associated with the industry or not, generally support shellfish aquaculture as a significant contributor to the economy of the area and significant component of Island character and activities. They also support some opportunities for expansion, but many want the industry to remain primarily locally owned and operated and maintained with minimal visual, noise and smell impact. Some upland residents, especially those in Gorge Harbour, fear that expansion or new development there will result in increased mechanization which they believe will cause visual and noise impacts. They also worry that if operations are allowed to expand, they will be sold to outside interests who will conduct operations with less care for the Island and its residents, or community spirit than currently shown by many local operators.

Significantly increased numbers of rafts at some sites and mechanization at one site have resulted in repeated claims that environmental, noise, smell and visual impacts from farms are already interfering with other values, uses and enjoyment of the area. Biological carrying capacity of the Harbour for shellfish aquaculture has also been a subject of continuing debate which prompted an extensive carrying capacity study. Some residents have also expressed concerned about cumulative effects of the industry on the Gorge Harbour ecosystem. Several Islanders have reported that the Harbour is important for anchorage throughout, due to its protection from wind and waves, and claim that rafts can significantly interfere with boat anchorages.

Some Islanders have taken particular issue with provincial agency and Regional District delays in enforcement of regulations, tenures, licenses and bylaws and control of visual and noise disturbance in Gorge Harbour. At the same time not all Plan Area residents have clearly understood the regulatory roles and capabilities of provincial and local government agencies with respect to enforcement.

Given that the use of machinery at off-bottom sites has become an issue in Gorge Harbour, a number of Islanders want the use of machinery restricted to the northern, more remote part of the Island. However, operators feel that wave exposure in those areas significantly limits development opportunities for off-bottom culture. Operators indicate that for off-bottom culture to be economically sustainable and competitive, some mechanical development is required, but that there are ways to mitigate noise and visual impacts. Some residents advocate general spacing guidelines and area limitations for shellfish culture relative to upland residences to avoid or reduce social impacts from off-bottom culture. There have also been calls for no further expansion, or a reduction of the industry in Gorge Harbour.

Many of the natural clam beaches in the Plan Area not tenured for aquaculture are of interest for commercial and recreational wild clam harvesting and many Island residents have asked that these beaches be maintained for that purpose. A number of commercial harvesters have also expressed interest in applying for shellfish aquaculture tenures in the Plan Area.

As a result of these escalating conflicts, LWBC and MAFF decided to not accept any applications for shellfish aquaculture expansion or new development for Gorge Harbour, until completion of the Cortes Island Coastal Plan. LWBC, MAFF and the RDCS also committed to collaboratively implement a compliance and enforcement program upon Plan completion, in order to take advantage of the information and context provided by the Plan.

1.5 Planning Process

The planning process used to develop and complete the Cortes Coastal Plan is generalized in Table 1. The process was led by government staff and took a consultative approach to public and interest group engagement, rather than consensus-based negotiation using stakeholder planning tables. Consultation with the public included a public open house meeting, held on June 19, 2002 and a combination open house and public meeting held on May 24th, 2003.

The RDCS had established a community shellfish planning committee in January 2002 to address shellfish aquaculture issues on Cortes Island. Upon request from MSRM, RDCS agreed to have the shellfish committee also operate as a planning advisory committee to provide feedback on the draft Plan to the Province and the Regional District Area Director as part of the consultation process. MSRM and other agency staff met with the advisory committee on several occasions between June 2002 and May 2003. Advisory committee meetings were open to the public and took place on Cortes Island.

This process included review of draft resource and planning unit maps as well as information and plan contents with interest groups, stakeholders, industry associations, First Nations and the advisory committee during various stages. Consultation included telephone discussions and email correspondence with various individuals. A list of groups consulted and meetings is provided in Appendix 3.

Federal and provincial agencies provided important advice and information during Plan development. In addition, a number of provincial agencies participated in final review of the Plan, prior to its approval (see Plan acknowledgements).

Although all four First Nations in the Plan Area were invited to participate in the planning process, only the Klahoose and Sliammon participated with government staff in the development of the Plan. The Hamatla Treaty Society reviewed the final draft Plan and staff provided a technical response. The Homalco First Nation did not respond to invitations to participate. The final draft Plan was distributed to all First Nations for formal review and comment.

Table 1. Generalized Process for the Cortes Island Coastal Plan.

January 2002 - June 2002	Confirm provincial technical team Enlist RDCS shellfish committee as advisory committee to the Regional District for the Cortes Coastal Plan Confirm terms of reference Confirm process with RDCS Hold initial discussions with advisory committee Hold first Plan open house Develop and acquire resource data and appropriate map products
July 2002 – April 2003	Confirm process with Klahoose and Sliammon First Nations Update resource map information based on local input Develop draft planning units, unit descriptions and recommendations and review with advisory committee, RDCS and Director Review draft Planning Unit information with Klahoose, Sliammon and Hamatla Treaty Society Hold additional meetings with individual stakeholder groups and First Nation representatives
May 2003	Post draft Plan on website Review draft Plan with advisory committee, stakeholder groups, First Nations government agencies; make appropriate revisions Formal draft Plan review with Klahoose, Sliammon. Technical staff review of draft by Hamatla Treaty Society Develop economic and environmental assessment of the Plan Hold final public open house & meeting with advisory committee Public review and comment of Plan following public meeting
June 2003	Final review and refinement of draft Plan with agencies and First Nations Receipt of review comments from RDSC Director Complete Provincial government approval process
July 2003	Sign-off by Minister of SRM Public announcement of Plan Post final Plan on website

1.6 Regional District of Comox Strathcona (RDCS)

The RDCS has collaborated with the Province in development of the Cortes Coastal Plan in order to guide shellfish aquaculture development in an environmentally, socially and economically sustainable manner. However, given that this is a provincial Plan, the Regional District has reserved the right to disagree with Plan provisions. The RDCS has recently embarked on a community review of the existing zoning bylaw for Cortes Island with the intent of updating it. However, given the contentious nature of shellfish aquaculture in Gorge Harbour and the development of this Plan, the Regional District has been awaiting the outcome of this Plan before addressing the aquaculture provisions of the zoning bylaw.

Bacterial contamination of marine areas from sewage discharges is an issue of concern for all Island residents, whether shellfish harvesters or not. Areas of particular concern are Gorge Harbour, Squirrel Cove, Cortes Bay and Carrington Bay, all of which are currently designated as "No Discharge Zones" under federal regulations. The RDCS has already made great efforts to promote control of sewage contamination and would like this Plan to support its efforts to implement mechanisms to maintain and improve water quality in order to sustain environmental, tourism, recreation and shellfish aquaculture values on the Island.

2.0 Plan Area Description

2.1 Physical and Oceanographic Features

Terrain and Geologic Setting

The coastal waterways of British Columbia are located in a coastal trough known as the Georgia-Hecate Depression. Formed around 150 million years ago through the process of continental drift; the depression extends from the Gulf of Alaska to the Gulf of California.

Since its inception, the Georgia Depression has been subjected to a number of geological processes, resulting in the complex system of channels and islands in which Cortes is located. With the final retreat of the Cordilleran Ice Sheet 14,000 years ago, a mantle of sand and gravel were deposited over the surface of Cortes and surrounding islands.

Almost the entire rocky shoreline of Cortes Island is made up of granite bedrock. Portions of the Twin Islands are made of sedimentary bedrock. Marina Island is composed completely of unconsolidated glacial deposits that are easily eroded and transported by wave action. The Island is characterized by a predominantly rocky shoreline with numerous protected bays, deep channels, and nearshore sand and gravel flats at its southern end.

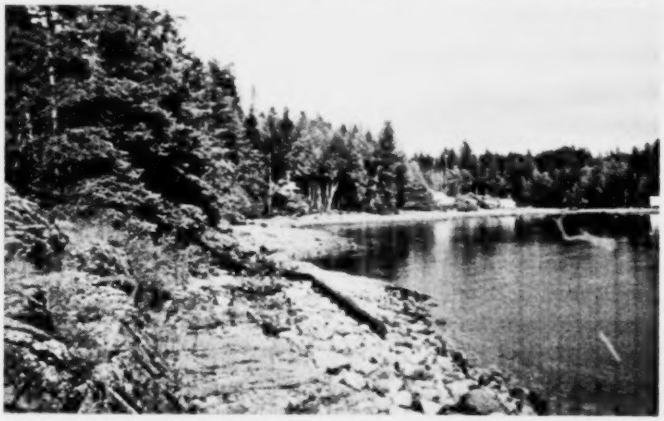

Figure 4. Foreshore of Whaletown, Cortes Island. (Chad Egan photo).

Temperature

Cortes Island has a mild climate with gradual seasonal variation. Temperatures in the area are moderate throughout the year with monthly means ranging from 3°C in January to 18°C in July (Figure 5). Snow and freezing temperatures may occur in winter, but tend to be less severe and shorter lasting than adjacent continental areas. The temperatures in the Cortes Island Area are highly consistent with the Strait of Georgia as a whole.

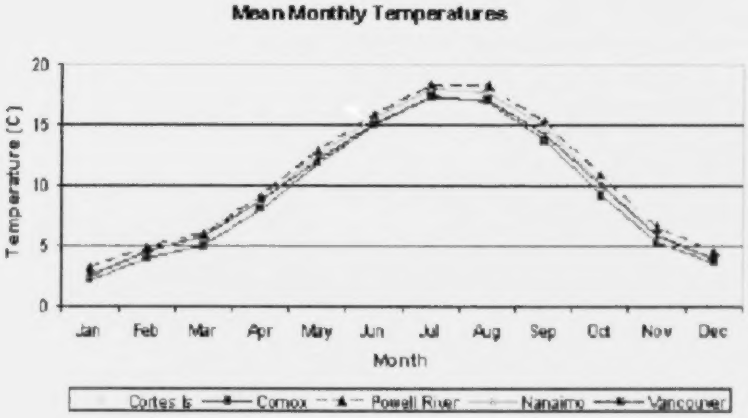

Figure 5. Monthly Average Temperature; Comparing Cortes with Stations in Comox, Nanaimo, Powell River and Vancouver. Source: Environment Canada, Climate Norms.

Precipitation

Winter months experience moderate levels of precipitation with yearly rates of approximately 1300mm. Precipitation levels are heaviest during the months of October through December with monthly levels averaging over 150mm. The months of April to September are noticeably drier with monthly levels mostly below 60mm/month (Figure 6).

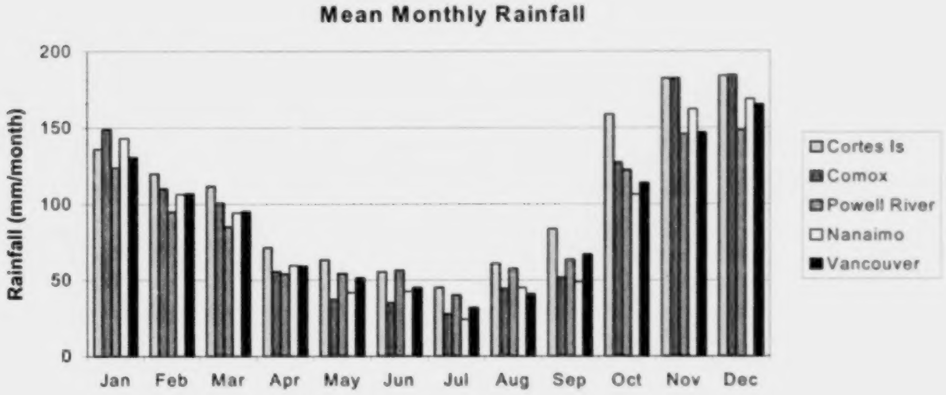

Figure 6. Monthly Average Rainfall; Comparison of Monthly Average Precipitation Levels between Cortes Island, Comox, Powell River, Nanaimo and Vancouver. Source: Environment Canada, Climate Norms.

Figure 4 presents a comparison of monthly average precipitation levels between Cortes Island and surrounding stations in the Strait of Georgia. While Cortes Island is very similar to most of the Georgia Basin stations, it is interesting to note that the fall months (Sept./ Oct.) are slightly wetter than most of the other stations.

Stream Runoff

Although the watersheds of the Cortes Island Plan Area are small, there are larger basins both east and west of Cortes Island that may influence the surrounding water properties. Those on adjacent Vancouver Island and the Sunshine Coast typically have streams showing peak discharges in the winter and lowest discharges in July and August, consistent with rainfall patterns (Figure 7). Some show a minor peak in June as a result of snow melt runoff. In contrast, the large watersheds on the mainland coast have a significant portion of the annual precipitation stored in the snow pack, therefore minimum discharge is in the winter and peak discharge is in the summer (July and August), as illustrated by the Homathko River discharge curve in Figure 8.

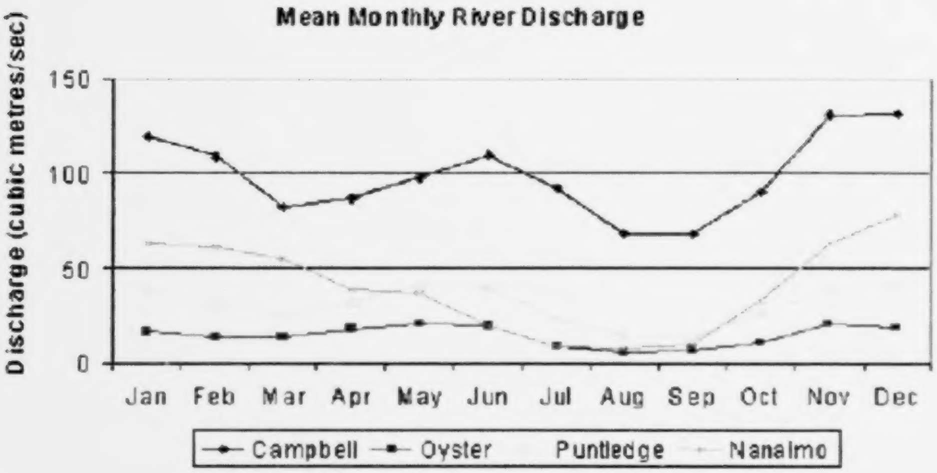

Figure 7. Mean Monthly River Discharges; Comparison of Monthly Average Discharge for Vancouver Island Rivers. Source: Inland Waters Directorate (1991).

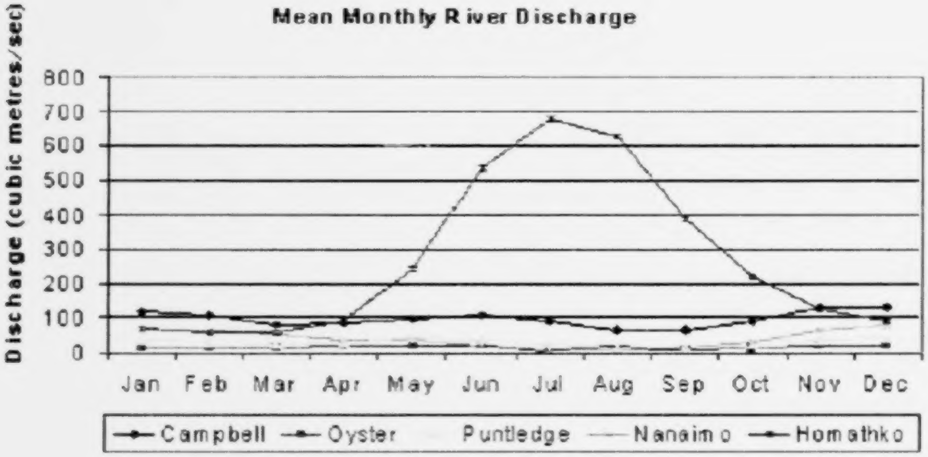

Figure 8. Mean Monthly River Discharges; Comparison of Monthly Average Discharge for Vancouver Island Rivers and the Homathko River. Source: Inland Waters Directorate (1991).

The implications of these discharge patterns for marine planning purposes are two-fold: 1) waters can be quite seasonally variable in terms of salinity as a result of different discharge regimes and 2) the surrounding waters may be quite stratified as a result of significant freshwater discharge, especially from the mainland fjords. The Fraser River discharge, which is ten times the Homathko River and peaks in June, may influence the water structure throughout the Strait of Georgia.

Sea Surface Salinity

Salinity in the Northern Strait of Georgia is influenced primarily by the freshwater runoff from watersheds of the Basin. Coastal fjords decrease salinity levels in the Strait through the discharge of freshwater from a vast number of glacial basins into the fjords, and through discharge from the Fraser River (Figure 9).

Lighthouse station data of measured salinity in the region illustrates the seasonal variations that typically occur as a result of seasonal variation in discharge. The curves show a strong minimum salinity in July associated with the Fraser River freshet.

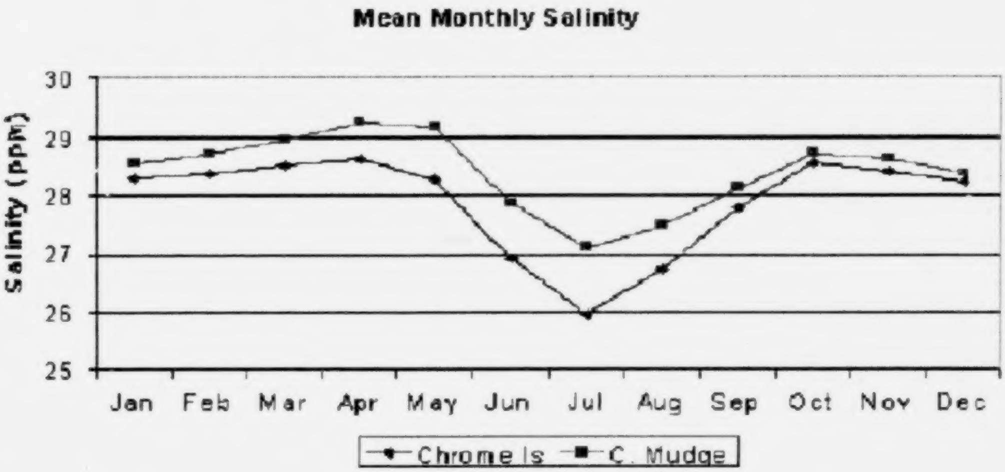

Figure 9. Monthly Salinity Values; Comparison of Monthly Salinity from the Cape Mudge ('36-'84) and Chrome Island ('61-'03) Light Stations. Source: DFO Website.

The oceanographic region in the vicinity of Cortes Island is a transitional one with well-mixed, cold, saline channels to the north and stratified, estuarine like Georgia Basin and fjords to the south and east. Intense tidal mixing along the channels keeps stratification from forming but the cool, upwelling water is low in oxygen. The strongly stratified regions to the east, caused by freshwater surface runoff from the fjords, and to the south, caused by freshwater runoff from the Fraser River results in high surface water temperatures during the summer. This warm surface layer frequently supports algal blooms.

The surrounding straits and channels of Cortes Island connect the many fjord systems of the area to the Strait of Georgia. Although more stable than the adjacent inlets of Desolation Sound, salinity levels of the Plan Area are moderately influenced by the seasonal freshwater discharge from these systems.

To the west, Lewis and Calm Channels display a relatively stable water column. Lower salinity levels occur towards the northern end due to runoff from Bute and Toba Inlets, yet dissipate when reaching Teakerne Arm. Northwest of Cortes, Sutil Channel shows a more stable water column with little dilution and steady temperatures.

South of Cortes, the Strait of Georgia is significantly influenced by the freshwater discharge of the Fraser River and Howe Sound. This seasonal dilution, erratically dispersed by winds and tides, sweeps up the Sunshine Coast as a semi-dilute mass forming a distinct boundary of salinity and temperature in the waters between Cortes and Texada Island.

Sea Surface Temperature

Summer sea surface temperatures in the Northern Strait of Georgia are known to be quite warm and are a key attraction for tourists. Figure 10 presents sea surface temperature data from Chrome Island, at the south end of Denman Island and Cape Mudge, at the south end of Quadra Island, where lower temperatures result, most likely from mixing and upwelling within the Johnston Strait waters.

These values present average monthly temperatures recorded from 1968-2002 and provide broad level characteristics for the Strait of Georgia. Recorded summer temperatures are more than double those in winter.

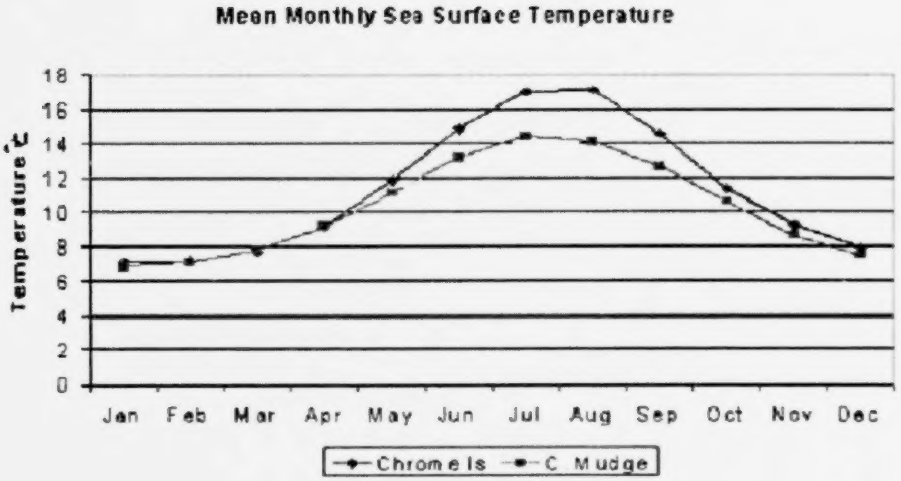

Figure 10. **Average Sea Surface Temperatures; Comparison of Sea Surface Temperature Measurements Recorded at Chrome Island ('61-'03) and Cape Mudge ('37-'84) Lighthouse Ltations within the Strait of Georgia. Source: DFO Website.**

Wind & Waves

The shoreline wave exposure levels are extremely important in controlling the distribution of biota along the shore as well as providing an important constraint to development along the coast. A generalized view of exposure is indicated in Figure 11 and shows that the southwest corner of the Island is the most exposed. Most other portions of the coast are relatively protected, with the most sheltered areas in the harbours and lagoons.

Wave action is also important in redistributing sediment along the coast, especially where sediments are easily eroded, such as on Marina Island, where sediment is transported from the south-facing shore to the north and re-deposited as a spit.

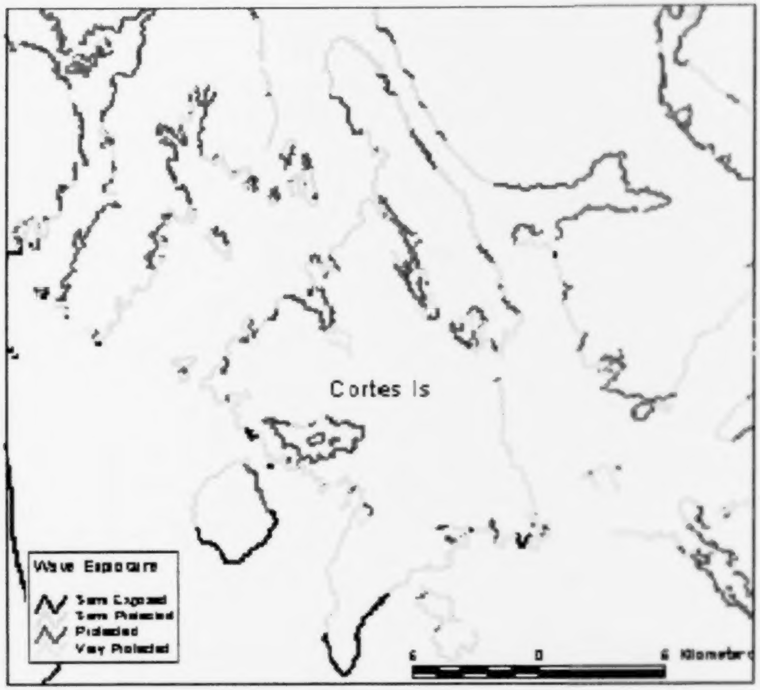

Figure 11. Generalised Wave Exposure Levels; Ratings Range: Red = Semi Exposed, Purple = Semi Protected, Green = Protected and Yellow = Very Protected. Source: MSRM Shorezone Dataset.

Currents & Tides

Currents are generated by tidal action and by winds and are extremely important in creating mixing energy that contributes to a break-down of stratification in high current areas. Areas of high current are generally well-mixed with higher productivity levels than similar low current areas. In addition, currents represent an important consideration in the distribution of nutrients and planktonic larvae. As a rule, human activities generally avoid high current areas as lower current areas provide alternatives due to the inherent design and management challenges of higher energy conditions. Exceptions may be made for aquaculture practices that rely upon current flow for oxygenation and dispersal of wastes.

The tidal range in the Plan Area is between 3 and 4 m (Figure 12). Tides vary from almost diurnal (one tide per day) to semi-diurnal (two tides per day) throughout a lunar cycle. The variation in tidal elevation leads to strongly zonated species along the coast, with species in the upper intertidal zone adapted to lengthy drying periods and species in the lower intertidal zone adapted to short drying periods. The tidal variation also regulates the wave action across the intertidal zone and can be important in controlling pollutant impacts (i.e. oil spills). Changes in the tidal elevation also create currents throughout the region, however most currents are weak, <2 knots, except in some of the most restricted passages (The Gorge - 4 knots and Uganda Passage 3 knots).

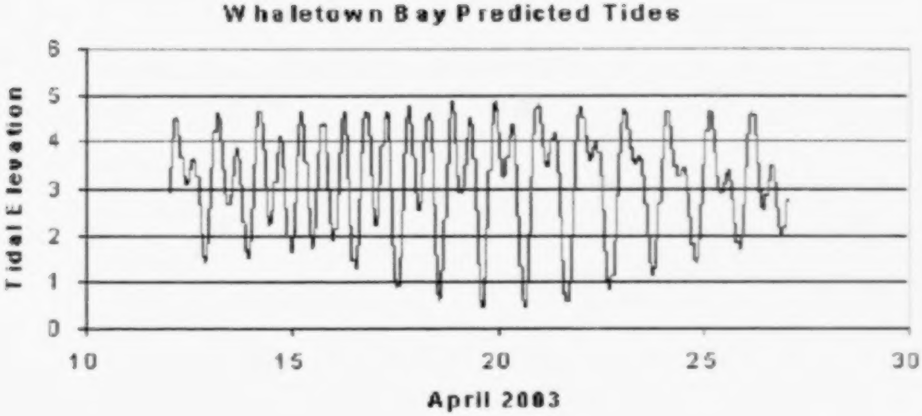

Figure 12. **Tidal Elevation Curve for Whaletown over a Lunar Cycle (~2 weeks). Source: Nobeltec Tide and Current Nautical Software.**

Seabed Relief

Seabed or benthic relief refers to the overall regularity of the seabed. An area with low relief will have a relatively uniform slope and little variation in elevation, for example a flat mud bottom. High relief areas exhibit considerable ranges in slope and elevation, as in the case of a rock reef. Relief plays a role in water column mixing but more obviously, an area with high relief is indicative of a more complex habitat for many organisms, notably rockfish and lingcod.

The seabed surrounding Cortes is of moderate relief with a relatively uniform slope of 5-20%.

The depths of the western shores of Calm and Lewis Channels range from 100-200 metres while the eastern shores of Sutil Channel quickly drop to greater depths of 200-400 metres. Southern areas are more moderate with depths of 50-100 metres.

Notably more complex areas of bottom relief include the surrounding seabed of Sutil Island and around the Twin Islands.

Seabed Substrate

Seabed substrate refers to the overall composition of the seafloor. Substrate can range from mud to sand to hard surfaces, including bedrock, boulders and cobble. Surficial sediment type is a significant factor for marine ecosystem composition as well as for the potential effects of development. Soft substrates of mud and sand provide habitat for a variety of invertebrate species as well as foraging grounds for seabirds.

Most of the deep seabed around Cortes Island appears to consist of mud, particularly to the east and north of the Island. Nearshore areas are variable and more appropriately indexed by the coastal substrate (see section below). To the south, Marina Island and the Sutil Peninsula represent large erosional glacial deposits that include veneers of boulders and cobble in the nearshore and sand in the deeper offshore.

Shore Zone Habitat

Shore zone habitat is primarily determined by the wave exposure level and the substrate type along the coast. Mobile substrates such as sand or small gravel prevent the development of perennial flora and fauna. Immobile substrates, such as bedrock or large boulders, typically have well developed flora and fauna, whose species assemblages are largely determined by the wave exposure level.

The generalized occurrence of substrates in the Plan Area are shown in Figure 13 and summarized in Figure 14. Of the slightly more than 200 km of shoreline, bedrock or bedrock-controlled shoreline is more common on the northern portion of the Island. Sedimentary shorelines, including sand flats and sand &

gravel beaches, are more common on the southern shores (Marina Island and Sutil Point). Estuaries and lagoons make up about 10% of the coast. Superimposed on this occurrence are the many areas of rock headlands and small sand and gravel pocket beaches leading to considerable complexity around the islands. The large saltwater lagoons (head of Carrington Bay and Manson's Landing) are regionally significant features of Cortes Island and are uncommon along the BC coast.

Intertidal and shallow sub-tidal rocky reefs provide highly complex substrate and are important for groundfish, such as lingcod and rockfish. These reefs also provide diverse habitat for micro and macro-algae, benthic invertebrates and many species of non-commercial fish, particularly in more exposed areas. The soft substrate of intertidal mudflats and sand beaches provide habitat for invertebrate species which live within the substrate (infauna such as clams, worms and burrowing crustaceans). These infaunal species are extremely important food sources for shorebirds and other waterfowl.

The nearshore biota of the Cortes Island Plan Area can be generally categorized into three habitat types: Rocky Shores, Protected Inlets and Bays and Beaches and Tidal Flats.

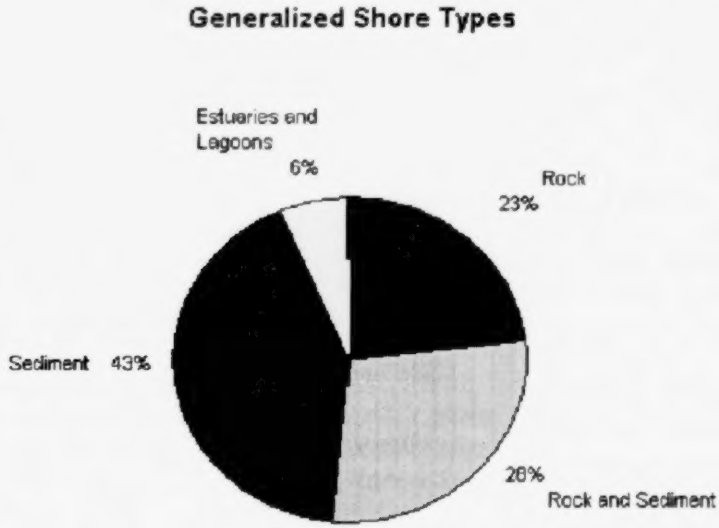

Figure 13. Generalized Shore Types around Cortes Island. Source: MSRM Shoreline Dataset.

Rocky Shores

Most of the rocky shores of Cortes Island occur in areas of lower wave exposure, relative to the open Strait of Georgia. Communities typical of semi-protected and protected rocky shores include assemblages of attached plants and invertebrates, usually showing across-shore intertidal zonation. Upper intertidal bio-bands include: acorn barnacles, rockweed (*Fucus*), Pacific oysters and blue mussels, while the lower intertidal zone has a low turf of mixed red algae, associated with Japanese weed (*Sargassum*) and with bladed kelps (*Laminaria* spp.). Species diversity is usually higher for areas with semi-protected wave exposures than areas with protected wave exposures. However there are also areas where tidal currents generate high marine species diversity (i.e. Gorge Harbour).

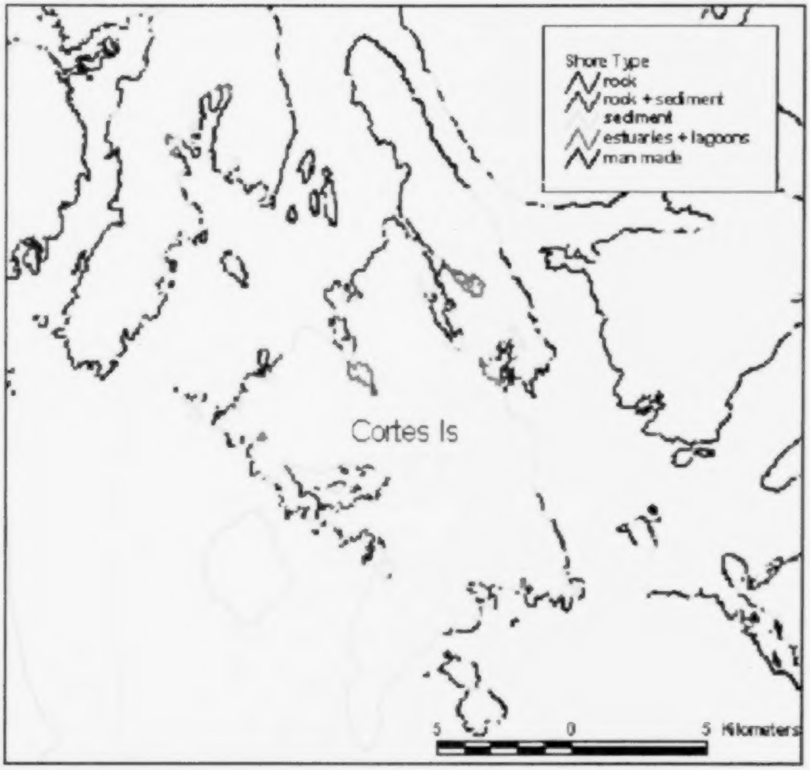

Figure 14. **Cortes Island Shore Zone Habitat. Source: MSRM Shoreline Dataset.**

Protected Inlets and Bays

In the most protected wave exposures, intertidal shorelines may look bare of attached biota. In the upper intertidal zone particularly at the heads of bays associated with freshwater streams or seepages, areas of salt-tolerant herbs and grasses form a distinct wetland species assemblage. Many protected inlets have rocky substrate in the upper intertidal, with muddy lower intertidal and shallow sub-tidal zones. The heads of the inlets are often characterized by protected tidal flats. Biota of these protected bays and inlets typically include acorn barnacle and rockweed (*Fucus*) in rocky, upper intertidal zones (sometimes sparsely distributed) and eelgrass (*Zostera*) in the lower intertidal mud. Associated invertebrates include various species of crabs, moon snails and clams.

Beaches and Tidal Flats

In the Plan Area, the highest wave exposure shorelines, on the south end of Cortes Island, are mostly mobile sand and gravel sediments and wide tidal flats. In the upper intertidal zone these shorelines tend to lack visible biota (due to the sediment mobility), however, within the lower intertidal zone, wide tidal flats occur (e.g. around Marina Island). These lower intertidal flats include eelgrass (*Zostera*) beds, mobile epifauna such as seastars and bivalves, as well as worms within the substrate (infauna). Scattered boulders provide stable attachment for larger algae, adding species diversity to these areas.

Marine Plants

Marine plant groups consist of (A) microscopic marine floating algae or "phytoplankton", (B) marine vascular plants or "sea grasses," and (C) marine attached algae or "seaweeds".

Phytoplankton provides the basis of the ocean food web. These minute, single celled plants are eaten by zooplankton which in turn serve as food for fish and a variety of invertebrates. They are present in all of the marine waters of Cortes, and their abundance varies seasonally with the availability of light and nutrients. When nutrients and light are optimal, high concentrations of phytoplankton ("blooms") can occur and may colour the water red, brown or green (e.g. "red tide"). Some species produce potent toxins that concentrate in filter feeding bivalves (clams and oysters) that can cause paralytic shellfish poisoning (PSP) and are a seasonal public health hazard. Other species can injure or kill without toxins, such as dinoflagellates, which have serrated spines that lodge within fish gill tissues.

Eelgrass (*Zostera marina*) is a marine vascular plant that grows in underwater meadows or "beds", rooted in finer sand substrates. These beds are most commonly found in protected waters in the lower intertidal and shallow sub-tidal zones, often at the heads of inlets. Eelgrass beds provide important rearing habitat for a variety of fish and invertebrate species including crab, herring, and juvenile salmon. They are also extremely productive and play an important role in stabilizing the finer substrate in which they grow. Eelgrass beds are sensitive to many foreshore development activities and are difficult to restore once disturbed. Over the past decade a smaller introduced species of eelgrass (*Zostera japonica*) has been expanding in range within the Strait of Georgia. This species grows at a higher elevation in the intertidal zone. Within the Cortes Plan Area, eelgrass beds are most extensive around Marina Island, Smelt Bay, the east side of Sutil Point, and Squirrel Cove. There are also eelgrass beds in Von Donop Inlet and the smaller bays on the northwest side of Cortes Island.

Salt marsh communities (*Salicornia* and *Distichlis*) often occur at the head of bays or along sections of shore with freshwater seepage. Like eelgrass beds, marsh communities are biologically productive and important fish and wildlife habitat. They are also sensitive to human disturbance including alternation of runoff pattern and physical disturbance. On Cortes Island salt marsh communities are most common in Squirrel Cove, Coulter and Cortes Bays and around the head of Whaletown Bay.

Canopy forming kelp beds (*Nereocystis* or bull kelp) are relatively uncommon on the Cortes shoreline. The most notable bull kelp beds are on the east side of the Subtle Islands and the south end of Twin Islands.

The rocky shores of the Strait of Georgia support a wide diversity of algal species which often occur as Bands vertically distributed across the intertidal and shallow sub-tidal zone. Characteristic algal bands in the Strait of Georgia include rockweed (*Fucus*), Japanese weed (*Sargassum*), green and red algal species (*Ulva*) and a host of red algae species as well as bladed kelp (particularly *Laminaria* and *Agarum*). Algal diversity and cover are generally greater in more exposed or high current areas such as the entrance to Gorge Harbour, and the rocky islets between Carrington Bay and Marina Island.

Invertebrates

The Plan Area contains a variety of invertebrate species that are harvested for commercial, recreational and First Nations use. Intertidal clams (littleneck, manila and butter clams) are the most commonly harvested bivalves. These clam species generally occupy mixed substrates of gravel, sand, mud and shell in the intertidal zone. Manila clams are found slightly higher in the intertidal zone than littlenecks, and butter clams occur in the sub-tidal zone. There are regionally significant intertidal clam beds on the beaches of Marina Island and Sutil Point and additional mapped beds at Squirrel Cove, Coulter Bay, Mary Point and Von Donop Inlet. There are likely also many smaller clam beds in suitable substrates throughout the Plan Area.

A number of beaches in the Plan Area are subject to seasonal and permanent closures for the harvesting of bivalves. These closures may occur as a result of sanitary conditions, as well as marine toxins such as red tide. Information on these areas may be found at:

http://www.pac.dfo-mpo.gc.ca/sci/lizette/osap/projects/Plankton/redtide.htm

Geoducks are large clams that occur in the lower intertidal and sub-tidal zones to depths of over 100 metres. They are found in sand and gravel/sand substrates and have been commercially fished by divers since the 1970's. The commercial geoduck fishery is the most valuable invertebrate fishery in British Columbia in terms of landed value. Geoducks are harvested on a three year rotational basis, with fisheries Planned for the Strait of Georgia in 2003, 2006 and 2009. The Underwater Harvesters Association has identified a number of major commercial geoduck beds in the Plan Area, but does not want such information published in this Plan. Many of these areas would also be of interest for geoduck and other sub-tidal species aquaculture, given that culture is most likely to be successful in habitat where wild stocks prosper. Several geoduck aquaculture tenures and enhancement sites exist in the vicinity of Marina Island.

Dungeness crabs are found to depths up to 100 metres, often in moderate to strong current areas with sandy bottoms. They are abundant in estuaries as well as more exposed areas. They are usually fished by trap, have a high commercial fishery value, and are important recreationally and for First Nation fishery purposes. Commercial crab fishing activity in the Plan Area is low, but is greater at the head of adjacent inlets. Various species of crab also can have an impact on sub-tidal as well as intertidal wild and cultured shellfish due to predation.

Several species of shrimp are found in Plan Area waters. The shrimp are harvested recreationally by traps and commercially by trawl gear (pink shrimp) or traps (prawns). Shrimp are generally found on the bottom, although some species range throughout the water column. Shrimp trawl activity in the Plan Area occurs primarily at the south end of the Cortes Island (off Sutil Point and Marina Island and in Baker Passage).

Prawns are the largest and most commercially lucrative of the Pacific coast shrimp species. They are primarily bottom dwellers, with typical habitat including the steeply sloping fjord inlets typically in waters of between 75 and 150 metres depth. They are commercially fished using traps set individually or on longlines. The Cortes Island area is considered to be a productive prawn fishing area (both commercially and recreationally) and fishing occurs around the islands at depths (75 to 125m) suitable for prawns.

Red and green sea urchins are also found in the Plan Area, generally in shallow areas with rocky substrates, moderate wave exposure and moderate to strong currents. Urchins graze extensively on algae, which in some locations results in drastic reduction of kelp and other seaweed beds. Urchins are commercially harvested by divers and processed for roe. There is a commercial quota for both red and green urchins in the Cortes Island Plan Area.

There are a number of sea cucumber species in the Cortes Plan Area, although the giant red (California) sea cucumber is the largest and the only species commercially harvested. It is found from the intertidal zone to depths of about 250 metres, on a variety of substrate and current conditions. Sea cucumbers are harvested by divers, usually during autumn and winter, and are also a food resource to First Nations. Commercial harvesting is limited to 25% of the BC coast due to the lack of stock information for certain areas. There is a small commercial quota for the Quadra/Cortes Island area. Bed areas are mapped by Fisheries and Oceans Canada and the Sea Cucumber Harvester's Association, but the data are confidential.

Finfish

Ground fish in the Plan Area include halibut, lingcod, rockfish, dogfish and flatfish which have supported important commercial, recreational and First Nation fisheries. Rockfish and dogfish are taken commercially by hook and line fisheries in the Plan Area. The entire Strait of Georgia is currently closed to commercial lingcod fishing. There are significant conservation concerns with inshore rockfish populations in the Strait of Georgia and declining rockfish stocks have resulted in announcement of an FOC rockfish conservation strategy, which includes designated rockfish recovery areas, where no recreational or commercial fishing using gear which could impact rockfish populations is permitted. No rockfish recovery areas have been designated in the Plan Area.

Herring are an important forage fish in the Strait of Georgia and a commercial herring roe fishery takes place in the Strait in March or April. Herring spawn on a variety of substrates, including algae and eelgrass in the intertidal and shallow sub-tidal zones, primarily in semi-protected areas during the month of March. Agency approvals for foreshore construction activity often restrict activities during the herring spawn period.

Historically herring have spawned at a number of locations within the Plan Area, including Marina Island, Smelt Bay, Mary Point, Squirrel Cove and Whaletown. The following website provides information on herring spawn areas around Cortes Island:

http://www.pac.dfo-mpo.gc.ca/sci/herring/herspawn/pages/default0_e.htm

There are few spawning records for the Plan Area since the mid-1980's. This reflects the general pattern in the Strait of Georgia of increased herring spawner biomass on the east coast of Vancouver Island (Parksville to Cape Lazo) and reduced spawner biomass in areas of historic, smaller spawning populations.

The federal/ provincial salmon spawning database:

http://pisces.env.gov.bc.ca/FishWizardFrames.asp

shows spawning records for chum salmon in Basil (Store) Creek which flows into Squirrel Cove and coho in the stream draining into Manson's Landing. Local information has also identified other spawning streams within the Plan Area (see Planning Unit descriptions in Section 3.8). Juvenile chum, pink and chinook salmon all use nearshore habitats (eelgrass beds and other vegetated areas) in rearing for several weeks to even months in the spring time. This occurs after they move from their natal streams to the marine environment.

Marine Mammals

Orcas or "killer whales" are the most frequently observed cetacean (whales and dolphins) species in the Cortes area. Most sightings are of the "transient" populations, which are distinct from "resident" and "offshore" populations. Orcas are less common in the Plan Area than in the northern waters of Queen Charlotte Sound and Johnstone Strait.

Humpback whales, Grey whales and Minke whales may occasionally be observed in the Cortes Island area. Historically there was a small, resident population of humpback whales in the Strait of Georgia and there have been several recent records of this species within the Strait. Minke whales are believed to shift northward during the summer months and southward during the winter, frequenting estuaries, bays and inlets. Dall and Harbour porpoise, as well as Pacific White-sided dolphins have also been observed in the Plan Area. Harbour porpoises are found in the shallower waters, often in bays, harbours, estuaries and river mouths. Dall porpoises prefer deeper ocean waters where they feed primarily on squid, fish and crustaceans. The Pacific White-sided dolphin also prefers deeper offshore waters where they feed on small schooling fish, such as herring and hake.

Harbour seals are common in the Plan Area throughout the year near coastal islands, reefs, sandbars, inlets, estuaries, and river mouths. Harbour seal haulouts are mostly located in the southern portion of the Plan Area, most notably Sutil Point as well as Marina, Reef, Little Rock and Twin Islands. California and Stellar sea lions are most abundant in the Strait of Georgia during the winter months (November to April), often moving with, and feeding on herring returning to the Strait to spawn in March. Sea lions do not breed in the Strait of Georgia, and information is limited as to the existence and location of haul-outs around Cortes during the winter and spring.

Birds

The Strait of Georgia is an important resting and feeding area for spring and fall migratory marine and shore birds. The Strait is also an important over-wintering area for marine birds including loons, cormorants, diving ducks and gulls. These species require continued access to sheltered bays and waterways, including estuaries and marshes.

Species nesting in the Strait include glaucous winged gulls, cormorants, pigeon guillemot and marbled murrelet. These longer-term visitors and resident species generally have additional management requirements, such as protection of specific breeding areas or habitats, and management of human activity or disturbance at critical times of the year.

Important bird-use areas include Cortes Bay, Sutil Point, Manson's Landing, Marina Island and the shores of Sutil Channel. Seabird breeding colonies in the Strait of Georgia have been identified by the Canadian Wildlife Service. There are documented seabird breeding colonies at Three Islets (pigeon guillemot and black oystercatchers) and neighbouring Little Rock (black oystercatchers and glaucous winged gulls). In addition, there is a documented great blue heron nesting colony near Whaletown. The second largest marine bird breeding colony (primarily for glaucous winged gulls, pigeon guillemots and pelagic cormorants) in the Strait of Georgia (Mitlenatch Island) is located about 10 km southwest of the Plan Area.

Red & Blue Listed Species

The provincial Conservation Data Centre (CDC) of the Ministry of Water, Land and Air Protection tracks plant and animal species at risk in British Columbia. These species may be at risk due to reductions in population size or threats to habitat resulting from human activities. Alternately these species may have a very limited range within the province or a critical stage of their life cycle (e.g. breeding) may occur in very specific habitats or small areas of the province. Red listed species are plants and animals which are being considered for the more formal designation of extirpated (no longer exists in the wild), endangered or threatened. Red listing, flags these species as being at risk. Blue listed species are considered to be vulnerable in British Columbia. Vulnerable species are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue listed species are considered to be at a lower level of risk than red listed species.

Table 2 shows the red and blue listed marine birds and mammals likely to occur in the Cortes Plan Area. Red and blue listings have not been completed for marine fish at the present time. The CDC does maintain a list of red and blue listed marine algae and invertebrates, but information on the distribution of these species is generally lacking for most of coastal British Columbia. Most data are single occurrence records or data taken from a very limited area.

Table 2. Red and Blue Listed Marine Birds, Mammals and Fish in the Cortes Plan Area.

Common Name	Scientific Name	Global Rank	Subnational Rank	BC Status
Birds				
Western Grebe	*Aechmophorus occidentalis*	G5	S1B,S3N	Red
Great Blue Heron	*Ardea herodias var. herodias*	G5G5	S3B,S4N	Blue
Surf Scoter	*Melanitta perspicillata*	G5	S3B,S4N	Blue
Common Murre	*Uria aalge*	G5	S2B,S4N	Red
Marbled Murrelet	*Brachyramphus marmoratus*	G3G4	S2B,S4N	Red
Mammals				
Killer Whale (Northeast Pacific north and south resident populations	*Orcinus orca*	G4G5T3Q	S2	Red
Killer Whale (West Coast transient population)	*Orcinus orca*	G4G5T4Q	S2	Red
Harbour Porpoise	*Phocoena phocoena*			Blue
Humpback Whale	*Megaptera novaeangliae*	G3	S1N	Blue
Northern Sea Lion	*Eumetopias jubatus*	G3	S2B,S3N	Red
Fish				
Eulachon	*Thaleichys pacificus*	-	-	Blue

Note: CDC Conservation Status Rankings (S = Provincial, N = National, G = Global)

X	**Presumed Extirpated or Extinct**	Not located despite intensive searches and no expectation that it will be rediscovered.
H	**Historical**	Not located in the last 50 years, but some expectation that it may be rediscovered.
1	**Critically Imperiled**	Because of extreme rarity or some factor(s) making it especially susceptible to extirpation or extinction. Typically 5 or fewer existing occurrences or very few remaining individuals.
2	**Imperiled**	Because of rarity or some factor(s) making it very susceptible to extirpation or extinction. Typically 6 to 20 existing occurrences or few remaining individuals.
3	**Vulnerable**	Because rare and local, found only in a restricted range (even if abundant at some locations), or because of some other factor(s) making it susceptible to extirpation or extinction. Typically 21 to 100 existing occurrences.
4	**Apparently Secure**	Because uncommon but not rare, and usually widespread in the province. Possible cause for long-term concern. Typically more than 100 existing occurrences.
5	**Secure**	Because common to very common, typically widespread and abundant, and not susceptible to extirpation or extinction under present conditions.
?	**Unranked**	Rank not yet assessed.
U	**Unrankable**	Due to current lack of available information.

Note. Conservation Status Rank Modifiers

E	Exotic – a species introduced by man to the province.
?	Inexact or uncertain due to limited information; qualifies the immediately preceding rank character.
Q	Taxonomic status is not clear or is in question.
T	Designates a rank associated with a subspecies or variety.
B	Designates a rank associated with breeding occurrences of mobile animals.
N	Designates a rank associated with non-breeding occurrences of mobile animals.

2.2 Social and Community Profile

Community and Demographics

The Plan Area is located within the Comox-Strathcona Regional District (RDCS) Electoral Area "I". It is also within the traditional territories of the Klahoose, Sliammon and Homalco First Nations and some of the member First Nations of the Hamatla Treaty Society. There is no municipal level of government. There are several settlements, including Whaletown, Manson's Landing, Squirrel Cove and Cortes Bay. The Klahoose Band has two reserves, Tork and Squirrel Cove reserves near Squirrel Cove. The Sliammon Band reserve (Paukeanum) is located near Manson's Landing.

Community services on the Island include a health centre, library, volunteer fire hall, community halls, and school (up to grade 10). Campbell River is the regional center for goods and services not readily available on Cortes Island.

Figure 15. BC Ferry Terminal in Whaletown, Cortes Island (Chad Egan photo).

The Plan Area is accessed primarily by water. BC Ferries operates scheduled ferry service between Quadra Island and Whaletown as well as from Quadra Island to Campbell River. Travel time between Whaletown and Campbell River is about 2 hours, which inhibits commuting for employment, entertainment, and the flow of goods and services. Over the past 15 years annual ridership on the Quadra/ Cortes ferry has grown at an average annual rate of 2% (Figure 16). The busiest time is July and August (reflecting the Island's tourism business), which has also grown at about 2% per year. The February/ March period (reflective of travel by permanent residence) has grown at 1% per year over the same period of time.

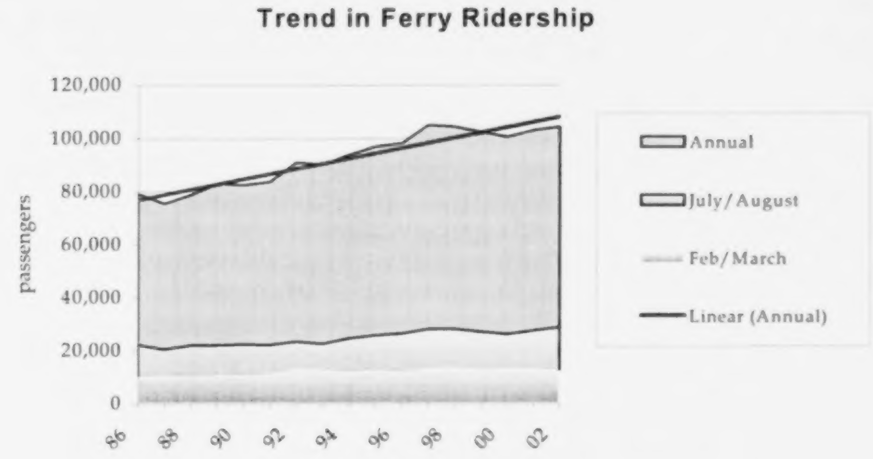

Figure 16. Trend in Ferry Ridership (Past 15 Years). Source: BCFC (2002).

The Cortes population is 1,000 persons (Census 2001). This is an increase of 5% relative to the 1996 Census. This growth is comparable to the provincial growth over the same period of 4.9%. However, many of BC's rural areas lost population relative to the 1996 Census, so Cortes Island's population growth may be significant when viewed from this perspective. For instance, three of the six regional districts on Vancouver Island had a decline in population growth relative to the 1996 Census. The Comox-Strathcona Regional District (RDCS) declined 1.5%. According to the Census, First Nation people make up about 10% of the Plan Area population (about 100 people) compared to 7% for the regional district. The average family size of 2.6 persons is slightly smaller than the 2.8 person figure for the RDCS. The mobility of the Cortes Island population is similar to provincial average, with about 20% of the population changing address within the past year. The age profile of the population differs from that of the RDCS (Figure 17). Currently, there are relatively fewer persons in the younger and older age groups, and a higher proportion of people in the 45-65 year age group. This profile may be reflective of the level of services available on the Island. For instance, schooling is available up to Grade 10, which may incline families with teenage children to re-locate afterwards. Similarly, the Island has basic health services (i.e. a clinic and doctor) that may not be sufficient for the older age group. Additionally, ferry connections do not facilitate commuting to Vancouver Island for employment opportunities. An age profile estimate for 2031 projects that in 25 years, more than 50% of the population will be 45 years of age or greater, compared with a figure of roughly 42% at present.

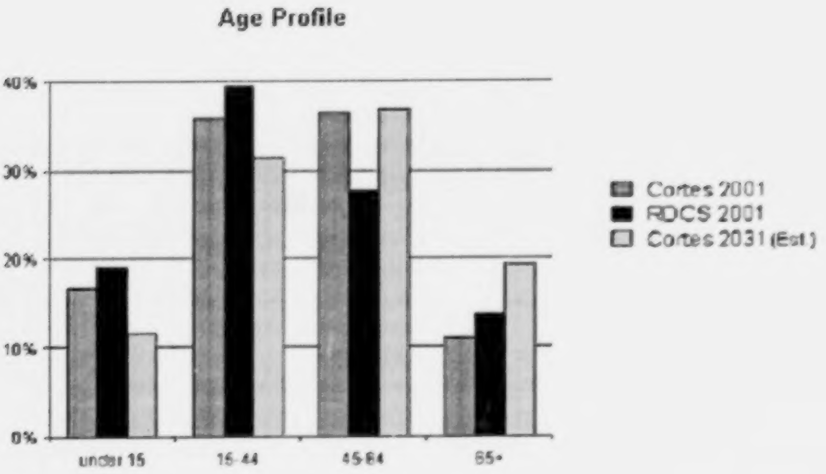

Figure 17. **Age Profile of Residents of Cortes Island (Along with Estimate for 2031) and the Regional District of Comox-Strathcona. Source: Statistics Canada, Census 2001.**

A population forecast for Cortes Island was not prepared by BC Stats. The latest long term forecast for the RD and Vancouver Island indicates that, over the long term, the RDCS population growth is expected to grow slightly faster than the rest of the Island (Figure 18). Most of this growth is attributable to in-migration. This would suggest relatively robust growth for the Plan Area. However, it is also the case that the Vancouver Island population will "age" significantly over the next thirty years. If Cortes Island's level of services to the older population continues to be relatively limited, this age group would be less inclined to move to the Island. This factor would moderate expected population growth that may occur for the RDCS generally.

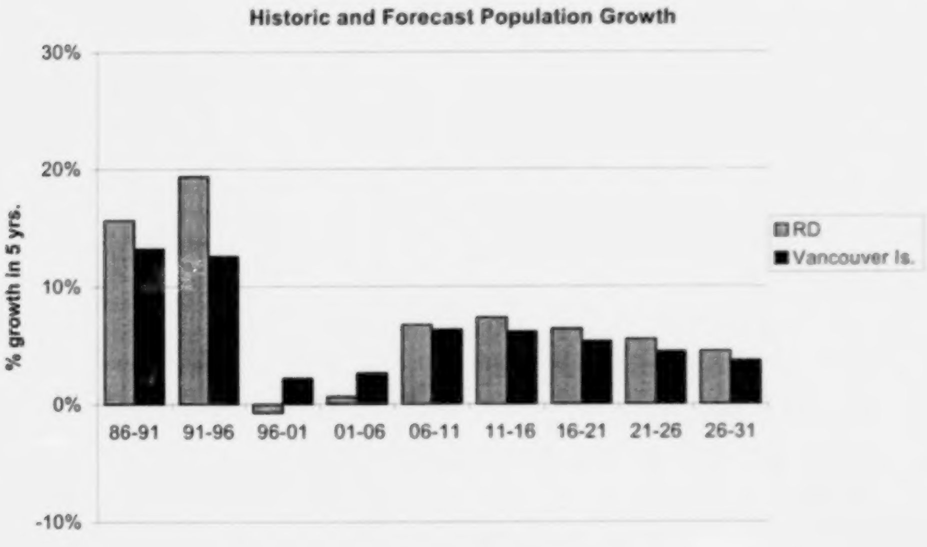

Figure 18. **Historic and Forecast Population Growth on Cortes Island. Source: BC Stats (2002).**

First Nations

Cortes Island is within the traditional territories of the Klahoose and the Sliammon First Nations. Other First Nations have also indicated traditional use practices or sites in the Plan Area, but these interests are not addressed here.

The Klahoose First Nation population is about 290 persons, but not all Band members live in the Plan Area. About 60 families live on the Tork reserve. There is no road access to Squirrel Cove Reserve and it is not inhabited. The Band is negotiating a treaty settlement under the BC treaty process and is at Stage Four of the six step process.

The Band's principle income generating activity is associated with shellfish harvesting (i.e. oysters and clams) on the Band's tenures. Production from the shallow water tenures is ramping up relative to recent performance. Harvesting activities employ 8-10 people. The product is sold to off-Island processors. The Band foresees potential for expanding aquaculture activities, by increasing shellfish production from current and future tenures, farming additional other species (e.g. sea cucumbers, black cod). The Band also harvests shellfish for subsistence and ceremonial purposes.

The Band holds a wood lot on the Island with an allowable annual harvest volume of 1,104 cubic meters. There has been no harvesting on the wood lot since 1996, but has commenced again in 2003. The harvesting employs about three people and the logs are sold on the open market and transported off-Island for processing.

The Band is not presently active in the tourism and recreation industry, but has a co-management agreement with BC Parks for the Ha'thayin (Von Donop) Provincial Marine Park. However, to date the Band has not been active in the management practices of the park. There is potential for providing eco-tourism services (e.g. bear viewing), and providing services to recreational boaters which may be developed in the future.

The Band holds a gillnetting license, but commercial salmon fishing has not historically been an important income earning activity within the Plan Area.

The Sliammon First Nation has reserve land near Manson's Landing (Paukeanum), but the reserve is not inhabited at the present time. Information on the Band's economic activities was not available from the Sliammon First Nations for the completion of this Plan. The Band previously had one tenure for shellfish aquaculture, and has indicated interest in securing that site again. The Band also has a number of traditional uses in the area as well.

2.3 Economic Activities

Economic Overview

This section examines the income generating activities in Cortes Island's formal economy. The economic perspective presented here corresponds to the formal economy. The economic significance of barter exchange and other unrecorded activities is not addressed in this profile.

Formal sector income is derived from employment, and non-employment sources. The Plan Area's employment participation rate (i.e. percent of prime age persons in the workforce) is 67% compared to a provincial rate of 65%. The unemployment rate was 6.7% (Census 2001) compared to a provincial average of 8.5%.

Forty six percent of the Plan Area workforce indicated they work from home as compared to 10% provincially. Eighteen percent have no fixed workplace address as compared to 11% provincially. Given the Island's small economic base and the difficulty in commuting to Campbell River (the region's major employment centre), the preponderance of home based offices is understandable. Non-employment sources of income are transfer payments, investment income and pension income.

According to the 2001 Census, there were 560 persons in the Island's labour force, or 56% of the population. This is higher than the RDCS or BC ratio of about 50%, but consistent with the larger proportion of working age persons on the island. The larger employers include BC Ferry Corporation, the

School District, Hollyhock Resort, four different stores and shell fish farming. Commercial fishing does not appear to be a significant economic activity, with about four boats involved.

The distribution of the labour force among industries gives an indication of the relative importance of income and employment generating activities. According to the 2001 Census, about 25% of the Plan Area's labour force was involved with goods producing activities (i.e. industries such as forestry, fishing, agriculture and manufacturing such as wood processing or food processing). A significantly lower proportion of the labour force is in wholesale and retail trade, but a higher proportion in "other services". Tourism related industries (i.e. food and accommodation) are included in "other services". There is a relatively high proportion of the labour force in Health and Education, however available Healthcare and Education services are not proportional to these figures, and in fact there are a minimum number of people to provide these basic levels of service within the community (Figure 19).

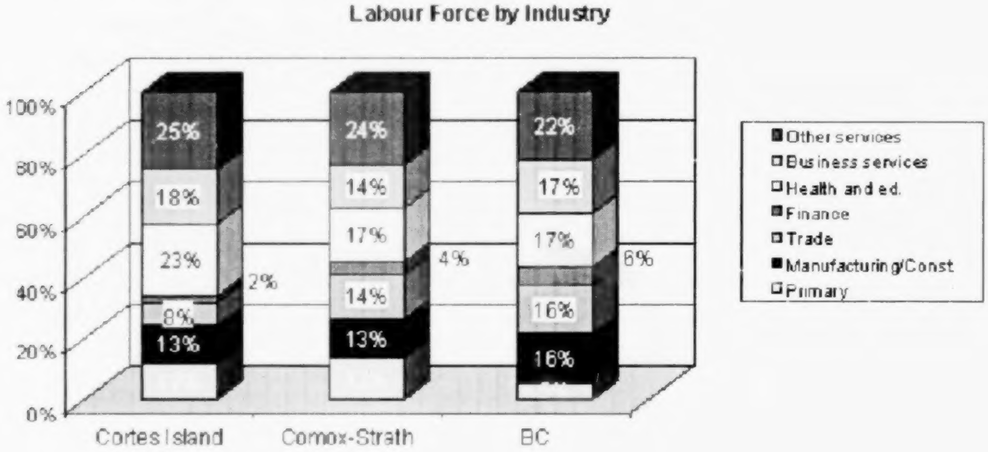

Figure 19. Cortes Island Labour Force by Industry. Source: Statistics Canada, Census 2001.

An analysis completed by BC Stats using 1996 Census data attempts to identify a small economy's "economic drivers". These are activities that bring income into the region. This would include activities that sell/ produce services outside the Plan Area, or sell services to visitors (i.e. accommodation services), as well as payment to public employees. Money that is recycled within the Plan Area by the economic driver industries creates additional "multiplier" economic activity (e.g. a shellfish farm employee buying groceries at Manson's Landing). This is termed a dependent activity and is attributed to the basic sector. The analysis, which included Quadra and Cortes Islands (Figure 20), indicated that fishing was the largest contributor to local income (i.e. commercial fishing, aquaculture and fish processing; in addition to related activities). This is followed by tourism and the public sector. Currently commercial fishing is not considered a significant contributor to local income on the Island. Forestry also does not appear to be a significant source of income for Cortes. Transfer payments and unemployment are substantial economic drivers (i.e. the spending of transfer payments on the island supports dependent employment).

Industry interviews were completed with a selection of aquaculture, tourism, and forestry operators within the Plan Area.

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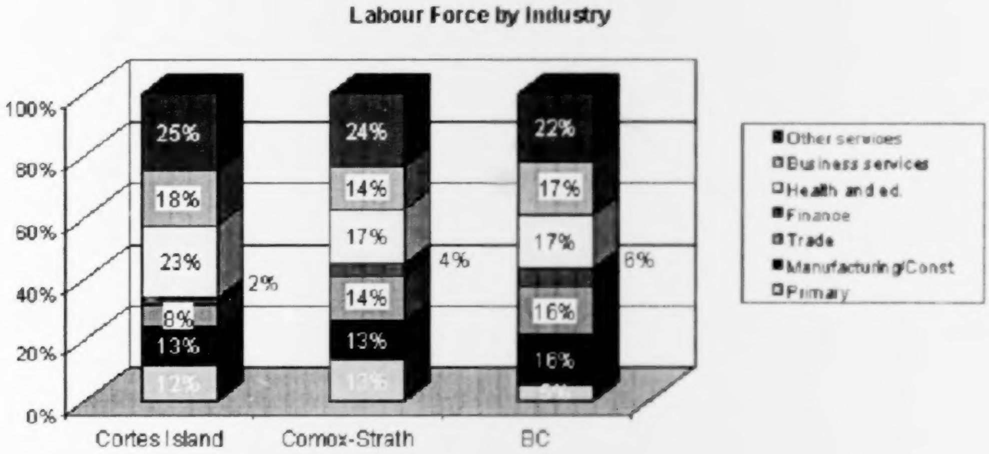

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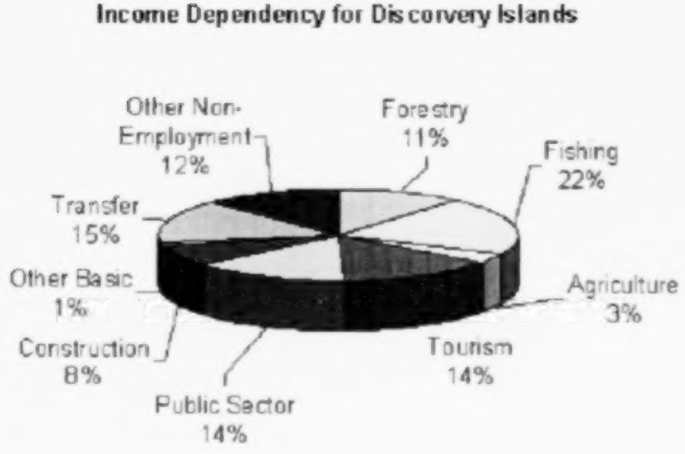

Figure 20. Income Dependency for Discovery Islands. Source: BC Stats (2002).

Aquaculture

Shellfish aquaculture is an important economic activity on Cortes Island and within the provincial economy. According to a recent survey of the provincial industry, the Cortes/ Quadra area contained 11% of the area under shellfish tenure provincially, and accounted for about 12% of the 2000 farm-gate value of production (Kingzett, 2002). General information about shellfish aquaculture in BC can be found at: http://www.bcsga.ca/

Information on shellfish aquaculture technologies can be found at: www.bcsga.ca/bcsgirs/main/sgmain.htm

Table 3. Top Four Shellfish Aquaculture Tenure Holders in the Cortes Island Plan Area. Source: BC MAFF, Seafood Development Branch (2002).

Company	ha.	# of Tenures
Fan Seafoods Limited	21.34	2
Klahoose Indian Band (in trust for)	14.70	2
Happy as a Clam Shellfish Ltd.	6.87	2
Fanny Bay Oysters Ltd.	9.32	3
Total	**52.23**	**9**

Plan Area specific information compiled for this report by MAFF and MSRM record 62 shellfish tenures in the Plan Area, of which 2 are sub-tidal (geoduck), 45 are beach, 12 are off-bottom and 3 are a combination of both beach and off-bottom culture. These tenures cover a total area of approximately 124.3 hectares (i.e. average tenure size of about 2.0 ha.). Gorge Harbour has the highest number of off-bottom operations (7) at 13.25 ha., which make up the majority of the 21.2 ha. occupied by off-bottom tenures in the Plan Area. Gorge Harbour also has the highest concentration of tenures (22) made up of 15 beach tenures at 16.44 ha. which combined with the off-bottom tenures total 29.69 ha. for shellfish culture. Tenures in the Harbour range in size from 0.24 ha. to 4 ha. with an average size of 1.33 ha. The next largest concentration of tenures is around Marina Island, consisting of 17 tenures for beach and 2 tenures for sub-tidal culture, covering a total of 54.55 ha. which is also the largest cumulative area occupied by shellfish culture tenures in the Plan Area. The second and third largest tenures (11 ha. and 10 ha.) in the Plan Area are also located there. The largest single tenure is for beach culture and held in trust by the Klahoose Band at Squirrel Cove (11.7 ha.). The four largest tenure holders collectively hold 9 tenures covering 36% of the tenured area.

A number of the industry participants interviewed held both beach and off-bottom tenures. Some off-bottom tenure holders (e.g. Bee Islets Growers) sub-let space to members of the organization whose tenures are outside the Plan Area).

Most of the tenures appear to be held by owner-operators that reside in the Plan Area or nearby (i.e. Campbell River). While the tenures appear to be held by a large number of operators, production is concentrated on a relatively small number of tenures. That is, the top ten tenures account for about 60% of the total farm gate value (2000 and 2001). Similarly, the average sales revenue per tenure is about $30,000, while the median income is about $19,000/ tenure. These statistics suggest an industry that is composed of a relatively large number of part-time or small operators, and a relatively small number of highly productive operations.

Figure 21. Oyster on the Half Shell (Brian Kingzett photo).

Industry interviews indicated that there has been some consolidation of operators on Cortes, but small operators still largely dominate it. A reliable indicator of industry consolidation is a rising tenure value and the number of tenures changing hands. A rising price will induce less productive farmers to sell (as they can make more by selling than continuing to work the tenure). The new owner must be more productive (to justify the price paid for the tenure) which usually means an increase in invested capital. Industry participants indicated that tenure values have been increasing, but data on transaction values were not reviewed for this Plan.

Oysters are the primary species produced (Table 4), and are sold shucked or in the shell. Clams and mussels are also produced in significant volume. Operators sell to licensed processors. Shellfish processors are located on Vancouver Island and Vancouver. Many operators have their produce custom processed and retain responsibility for finding a final customer. Final markets are varied. Examples of direct sales include customers (i.e. restaurants) in Vancouver, Toronto and Hawaii. Operators that sold direct indicated a doubling of their profit margin as compared to selling to a processor.

Table 4. Production from Plan Area Shellfish Tenures. Source: BC MAFF, Seafood Development Branch (2002).

	97	98	99	00	01
Clams & Mussels ('000 lbs)	60	127	92	97	226
Oysters ('000 doz)	220	265	229	269	242
Oysters ('000 gallon)	2	3	8	5	9
Number Reporting	36	47	43	42	48

The farm gate value (Figure 22) of shellfish production according to MAFF statistics has ranged from $813,000 in 1997 to about $1.5 million in 2001. The latest year recorded the highest sales, which was attributed to the large increase in revenue from the sale of clams and mussels.

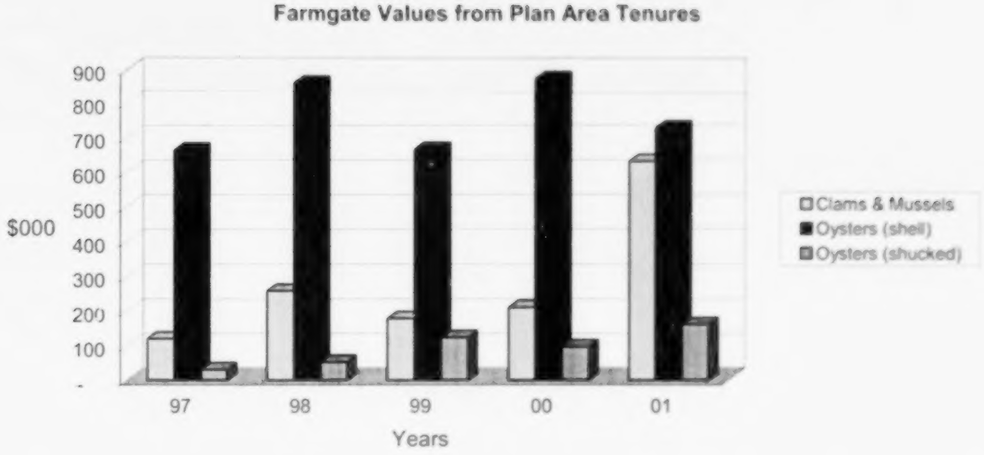

Figure 22. Farmgate Values from Plan Area Tenures. Source: BC MAFF, Seafood Development Branch (2002).

Industry interviews indicated that on an area basis, off-bottom leases are typically more productive than beach operations. Cortes Island producers indicated sales revenue per raft of between $5,000 to $15,000 (shucked and half shell respectively). Interviews also indicated that between 30-40 rafts per hectare could be efficiently worked with about half of the rafts harvested each year. This would provide a sales revenue coefficient of $75,000-$225,000 per ha./ year for off-bottom tenures in the Plan Area. Relative to the provincial average for off-bottom operations, the sales revenue of the Cortes farms is significantly higher. MSRM compiled a profile of an efficient off-bottom shellfish aquaculture operation based on an industry survey and other analysis. Annual sales revenues for this representative operator (or building block) were in the order of $55,000-$75,000.

The productivity of beach tenures is relatively more variable since it depends on the quality of the substrate as well as improvements by the farmer. Cortes Island industry interviews indicated gross sales values ranging from $10,000/ ha to $18,000/ ha. The industry average is estimated as $8000/ hectare.

The smallest operations that could support a viable economic operation were estimated by industry operators to be about five rafts for off-bottom operations. About 1.5 to 2 hectares of beach tenure is about the smallest economically viable size for this growing method. It generally takes about five years to develop a farm from start-up to an economically viable operating unit.

With respect to industry employment, a consistent estimate of fifteen rafts to support one full time equivalent position was reported by several operators. Beginning wage is about $12 per hour, and the more experienced individuals receive $15 per hour. This corresponds to an annual wage in the order of $21,000 per year. Given the farmgate value in 2001 of $1.5 million (reduced by 50% to account for expenses), this would indicate industry supports some 36 full time equivalent (fte) positions. These full time positions are manifest as full time, part time and seasonal jobs. Hence the number of people holding jobs at some point during the year could reasonably be double the estimate of the fte. It is noted that a recent estimate by Salter (2002) of direct employment for the Cortes/ Quadra Island shellfish industry was 44 full time positions.

Operators indicated that the farm operation itself did not generate large local expenditure on local goods and services. Most of the local economic impact would be from the responding of wages paid to employees. This could be in the order of $750,000 in recent years, which is substantial in the small Cortes Island economy.

Cortes Island aquaculture output stimulates additional activity in BC with the processing and retailing of the final product. It is reported that the BC input/output model has estimated a total job multiplier of 1.75 for the aquaculture industry. This would indicate that the 36 fte positions on Cortes Island would support additional employment of 27 full time positions; most of these would be in processing plant and supply firms on Vancouver Island as well as retail sales on Cortes Island. Total employment is estimated to be 63 full time equivalent positions.

Tourism and Public Recreation

Visitors to the Island create a demand for a range of goods and services that support local incomes and employment. Many of the prime attractions for visitors are saltwater based or along the coast. The primary season is June through August. This season is reflected in BC Ferries monthly passenger statistics, which compares annual monthly passenger traffic in 1986 and 2002 (Figure 23). Relative to 1986, monthly passenger traffic has increased in every month. There is an evident increase in the shoulder season passenger traffic.

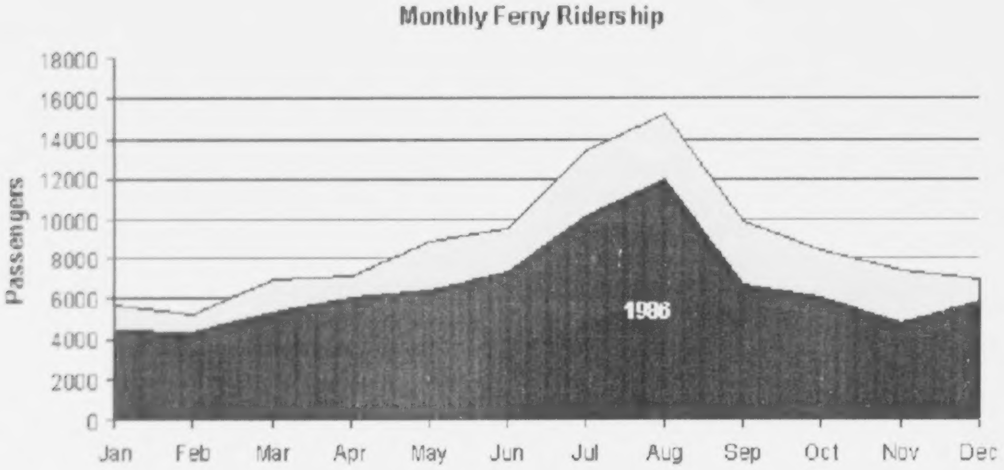

Figure 23. Monthly Ferry Ridership (Cortes/ Quadra Route). Source: BCFC 2002.

The tourism industry is composed of a variety of establishments, some of which serve the Island residents as well as visitors. A distinction is made between visitor spending, which is new income (or basic income) verses resident spending which is re-circulation of basic income. Island facilities that cater almost exclusively to visitors are motels (1), Resorts (3), bed and breakfast operations (9), in addition to a number of rental cabins, parks, campgrounds, marinas, and adventure tourism operations (Table 5). According to recent visitor data, the Smelt Bay Provincial Park is the busiest of the three provincial parks on the Island.

The largest operator in the industry, Hollyhock Resort, indicated that it currently employs 12-15 persons full time, and 75 to 80 persons on a seasonal basis. The resort has increased its business in recent years[2] by extending its operating season, which is presently April through November. In the latest year, about 2,300 guests visited the facilities with an average stay of about five days. The second largest operator, which indicates it, generates significant economic activity for the Island economy is the Gorge Harbour Marina Resort with a seasonal staff of 25 local employees.

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[2] This has been made possible by investing in winterizing the facility.

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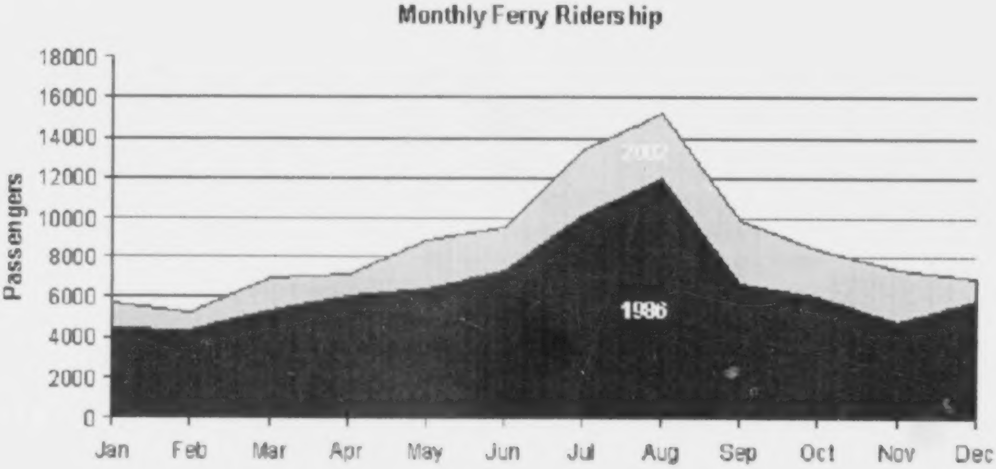

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[2] This has been made possible by investing in winterizing the facility.

Table 5. **Provincial and Regional Parks on Cortes Island**

Park Name	Size (ha)	Salt Water Access	Average Annual Person Visits[2]
Smelt Bay[1]	16	✓	11,887
Manson's Landing[1]	47	✓	6,072
Ha'thayin (Von Donop) Marine Park[1]	1277	✓	3,574
Kwas Lake	249		na
Cortes Boat Launch	1	✓	na
Carrington Bay	214	✓	na

Notes:

1. denotes provincial park, otherwise regional park
2. average for 1999 and 2000 except Ha'thayin Marine Park which is 1999 only

Employment and income estimates for the Island's tourism industry were not readily available at the time of data compilation. Based on the make-up of the Island's industry, it is estimated that the industry supports about 85 full time equivalent positions. However, a much larger number of people are actually employed on a seasonal basis. It is estimated that the industry pays annual wages to on-island employees of some $1.3 million in recent years. Gross revenue generated by the Island's tourism industry is about $2.9 million. Hollyhock Resort accounts for about 70% of the tourism industry's economic impact on the Island.

Forestry

Commercial management activity occurs on public and private forest lands. With respect to the management of Crown forest land, two replaceable Timber Sales Licenses are issued with a total annual harvest of 900 cubic meters. The Klahoose Band holds a wood lot license with an approved annual harvest of 1,104 cubic meters. Most of the remainder of the commercially valuable Crown timber volume is under forest license to Canadian Forest Products. Presently, timber harvest activity is very low. Cutting permits are approved for the wood lot and the timber sales licenses at the time which harvest takes place on the wood lot.

Weyerhaeuser Canada owns about 1,600 hectares of private forested lands. The company is in the process of selling parcels of land. Six parcels have been sold, and ten parcels are expected to be offered for sale in the near future. The parcels range in size from 10 acres to 160 acres. The land is zoned F1 (permits 1 domicile) and is subject to development covenants. The new owner may continue to manage the land as a working forest. Apparently several of the six parcels sold will continue to be privately managed forested land. It was indicated that the covenants are intended to respect the parcels' for ecological values. Development plans are subject to review by Nature Trust of BC.

There is no permanent wood-manufacturing mill on the Island. In general, timber harvested on the Island is transported to manufacturing facilities elsewhere.

2.4 Current and Anticipated Development Interest

The BC Shellfish Growers Association views Cortes Island, and, in particular Gorge Harbour, as a highly desirable shellfish growing area with considerable remaining biological carrying capacity. It would like to see the Province identify the area as a priority area for shellfish aquaculture, and the industry operating in the area deemed as environmentally sustainable.

Two proponents are interested in developing beach culture sites in the north part of the Plan Area. Three existing growers have indicated an interest in expanding their off-bottom operations in Gorge Harbour. One off-bottom tenure holder in Gorge Harbour is also pursuing a change in his shellfish aquaculture management Plan to permit a significant expansion of the number of rafts within the existing tenure to culture mussels. One off-bottom tenure holder has indicated he will be reducing the number of rafts on his site. The Klahoose First Nation has clearly indicated an interest in developing two new off-bottom culture operations in Gorge Harbour and additional off-bottom facilities in Squirrel Cove as well as a number of beach culture operations in the south part of Cortes Island, including Goldmine Bay. The Sliammon First Nation has also expressed an interest in some beach culture opportunities, but not in Gorge Harbour. One non-First Nations group has expressed an interest in one new off-bottom operation in Gorge Harbour.

Although interest has been expressed in shellfish aquaculture development around the Island it is not clear how many applications will come in for sites in the overall Plan Area. It is also not possible to predict how many sites are likely to be developed because the Plan does not identify individual sites outside of Gorge Harbour, and many unpredictable biophysical and social factors affect what specific sites are applied for and what sites get approved.

In the case of Gorge Harbour much clearer information is available on industry interest as indicated above. Also, the scale of analysis done during this Plan on Gorge Harbour due to the intensity of conflict there provides a much better idea of what sites are of interest and what sites may be the subject of applications. Further, virtually all the beach sites are subscribed in the Harbour and the Plan has capped the number of new rafts at 557 in the Harbour which provides additional information to enable a more detailed analysis for that area. Section 5.2 in the Plan explores the economic and community implications of Plan provisions, with some emphasis on Gorge Harbour.

3.0 Plan Framework and Direction

3.1 Use of the Plan

The Cortes Island Coastal Plan is designed to assist prospective land tenure applicants, First Nations, local government, LWBC and other government agencies in dealing with shellfish aquaculture applications for the use of provincial Crown foreshore and nearshore tenures. The Plan is also designed to provide a context for enforcement and compliance roles and measures taken by regulatory agencies to address issues associated with existing operations.

The Plan is expected to provide an information base that agencies can use to address issues such as trespass and social impacts, within the limits of their jurisdiction.

Use of the Plan should benefit First Nations, local government, LWBC and other government agencies by screening or filtering potential Crown land applications which may have limited likelihood of success. In this way, work loads of these agencies and organizations can be expected to be lowered in both volume and level of complication or controversy. The Plan can also inform the public on the activities for which each agency is responsible.

Figure 24. Gorge Harbour Entrance with Nearby Raft Culture (Brian Kingzett photo).

With the exception of other compelling constraints or LWBC application requirements, applications for uses that are consistent with the Plan should be accepted and evaluated by LWBC. The Plan is not intended to directly address operational or production requirements associated with shellfish aquaculture, since day to day regulation of activities is the responsibility of Statutory Decision Makers, under their respective statutes and regulatory instruments. Such instruments include Crown land tenures, Aquaculture Licenses and Regional District Zoning.

Although the Plan reflects input received from the RDCS and the RDCS Planning Advisory Committee, the Plan is not intended to replace the need for referrals to local government. Similarly, the Plan is not intended to replace provincial or federal agency referrals or to absolve LWBC from addressing its legal obligations to consult with First Nations on land tenure applications.

This Plan recognizes the authority of the RDCS to develop zoning bylaws. Provisions of this Plan that prove inconsistent with RDCS zoning provisions will be need to be addressed through policy decisions related to the inconsistencies between local government and provincial government land use designations.

3.2 Strategic Direction: The Vancouver Island Land Use Plan

The recommendations of the Cortes Island Plan are intended to be consistent with the general direction provided by the goals, objectives and strategies outlined in the 2000 Vancouver Island Summary Land Use Plan (VILUP). Although many descriptions are terrestrially oriented, the VILUP does recognize the high recreation, tourism and aquaculture potential of marine components of the Area and also the potential for conflict. This Plan responds to VILUP recommendation for high planning priority and provides detailed planning recommendations consistent with the strategic direction of the VILUP.

The Plan Area is included within one Resource Management Zone and coastal planning unit identified by the VILUP. The applicable zone is summarized below in Table 6. Appendix 2 presents the detailed management provisions associated with the Quadra/ Cortes (SMZ-32) Coastal Planning Unit in the VILUP.

Table 6. Vancouver Island Land Use Plan Resource Management Zones

VILUP Coastal Planning Unit	Location	Overall Management Guidance	Planning Priority
SMZ-32: Quadra Cortes	Northern tip of Quadra Island, Cortes, Read and Maurelle Islands	General Management Zone, with significant recreation/ scenery and tourism values and immediate significance for biodiversity conservation; forest management practices should be adapted in design and scale to fit the nature, scale and sensitivities of the northern Gulf Island/southern Johnstone Strait environment.	High

3.3 Resource Maps, Planning Units and Unit Data

The area covered by this Plan has been divided into eight Planning Units. Several resource maps have been prepared that have assisted in the development of this Plan. The Planning Unit boundaries are largely based on the provincial Marine Ecosystem Classification System with some modification to reflect human use patterns and specific biological features. The Planning Units do not include provincial parks. Section 3.8 of this Plan presents descriptions and management recommendations related to shellfish aquaculture for each of these units.

For each Planning Unit, the Plan provides a description and map of resource attributes, existing tenured uses, non-tenured activities, status of adjacent upland, and resource capabilities for shellfish aquaculture uses. Although some upland features are shown on the maps, the Plan does not prescribe uses for these upland areas. These maps and the accompanying legend are available at the following sites:

website: http://srmwww.gov.bc.ca/dss/projects/sarp/cortes.htm (resource maps and Planning unit maps)
ftp site: ftp://gis.luco.gov.bc.ca/pub/coastal/cortes/jpg (Planning unit maps with legend)

Planning Unit descriptions and attributes reflect data drawn from two sources. Established government databases are the source of most of the data in this Plan. An equally important source of data provided in the descriptions and attributes is local knowledge gained through stakeholder consultation for this Plan, much of which has come from the "Friends of Cortes Island" and the advisory committee. Additional information was provided by Island residents during the public review of the draft Plan. Although local knowledge documented in this Plan has been recognized, displayed on the Planning Unit Maps and used to provide insight into particular attributes of an area, it cannot readily be added to established government databases without being gathered and validated according to provincial data inventory standards. It is therefore included in a separate map of "local knowledge" available on the above mentioned MSRM website and/or mentioned in the Planning Unit descriptions.

Planning Unit descriptions and maps in Section 3.8 also contain data regarding biophysical capability of areas to support shellfish aquaculture. These capability assessments, which are based on field sampling and reconnaissance, provide a broad scale analysis of biophysical conditions for beach culture of oysters and manila clams, as well as off-bottom culture of scallops and oysters. Such data provide a general guide to areas of Good and Medium shellfish culture capability, but cannot be used with certainty to select individual sites, without site-specific feasibility studies. The highest rating is "Good". A "Medium" capability rating means that an area is likely to be quite acceptable for shellfish culture.

The physical attribute tables at the beginning of each Planning Unit section (i.e. substrate, roughness, slope, etc.), are taken from the provincial Marine Ecological Classification System at the Ecounit level, as well as a report that MSRM contracted to a consultant for an area overview, and refer to deeper water features. The nearshore attribute descriptions which follow (intertidal and shallow sub-tidal) can be quite different from the offshore characteristics (i.e. the nearshore substrate of a unit could be predominantly rock with a steep slope in contrast to the offshore seabed which may not be steeply sloping). They may also differ from some Island resident personal ratings, given that the Plan ratings were developed as part of a standardized, province-wide process with a broader frame of reference than exists within the Plan Area alone, and Table 7 provides a description of the physiographic attributes (from the Marine Ecosystem Classification System) that are outlined at the beginning of each Planning Unit description. In order to also make use of local knowledge in the understanding of the characteristics of the Plan Area, local information provided on such factors as exposure, wind and wave action has been incorporated into the Planning Unit descriptions and indicated as local knowledge.

Table 7. Ecosystem Classifications

Depth	
Shallow	0-20m
Photic	20-50m
Mid-depth	50-200m
Deep	200-1000m
Abyssal	> 1000m
Temperature (summer at seabed bottom)	
Warm	9-15°C
Cool	<9°C
Slope	
Flat	0-5%
Sloping	5-20%
Steep	>20%
Current	
High	>3knots
Low	< 3knots
Substrate	
Mud	
Sand	
Hard	
Exposure (wave/fetch exposure)	
High	
Moderate	
Low	
Roughness (seabed relief)	
High	
Moderate	
Low	

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Substrate	
Mud	
Sand	
Hard	
Exposure (wave/fetch exposure)	
High	
Moderate	
Low	
Roughness (seabed relief)	
High	
Moderate	
Low	

Legend

▭ Planning unit

Biological Values

▭ Estuary

▦ Clam beach

▨ Kelp

∿ Herring spawn

🐟 Salmon stream

Seal/sealion haulout

Physical Shoreline Classification

∿ Channel

∿ Estuary wetland

∿ Man-made

∿ Gravel beach

∿ Gravel flats

∿ Rock cliff

∿ Rock platform

∿ Rock with gravel beach

∿ Rock with sand & gravel beach

∿ Rock with sand beach

∿ Sand & gravel beach

Sand & gravel flat

Sand beach

Sand flat

∿ Mud flat

Aquaculture Assessment

▦ Shellfish beach, clam - good or medium capability

▦ Shellfish beach, oyster - good or medium capability

▭ Shellfish deep water, oyster - good or medium capability

▭ Shellfish deep water, scallop - good or medium capability

Ownership and Tenure

Surveyed Crown land

Private land

First Nations reserve

▭ Existing protected areas

▭ Protection areas

Tenures

CA	Commercial A (year round)	
CB	Commercial B (seasonal use)	
CF	Community facility	
CW	Commercial wharf	
LH	Log handling/storage	
Ma	Marina	
Mi	Miscellaneous	
PM	Private moorage	
SFB	Shellfish aquaculture	- Beach culture
SFO		- Off-bottom culture
SFOB		- Off-bottom & beach culture
SFST		- Subtidal culture
U	Marine telecommunications & utilities	

▭ Land Act reserve or map notation

G	General
NOI	Notation of Interest
PW	Public Wharf
RP	Local or Regional Park
UREP	UREP reserve

Non-Tenured Activities

▲ Campsite (provincial, regional, private or undeveloped kayak site)

Boat launch

⚓ Safe anchorage

Local Knowledge Input

● Nereocystis kelp beds

● Eelgrass

🐟 Salmon stream

Sealions

High Marine Biodiversity

Sensitive Marine Habitat

Figure 25. Legend for Planning Unit Maps

3.4 Shellfish Aquaculture Uses

This Plan addresses three different forms of shellfish aquaculture along the foreshore and nearshore areas as shown in Table 8.

Table 8. Shellfish Aquaculture Uses Addressed in the Cortes Island Coastal Plan.

Use	Description
Shellfish Beach Aquaculture	Growing and harvesting of shellfish on tenured beach or intertidal locations, usually in the substrate. Associated facilities.
Shellfish Off-bottom Aquaculture	Growing and harvesting of shellfish and other invertebrates in off-bottom or sub-tidal locations, usually on suspended trays, long lines or other structures anchored to the sea bed or the shore. Associated facilities.
Shellfish Sub-tidal Aquaculture	Growing and harvesting shellfish in areas below the low tide where the culture is subsurface with no surface floats or structures. Associated facilities

3.5 Use Recommendations for Shellfish Aquaculture

LWBC is the provincial agency responsible for administering *Land Act* and *Water Act* tenures. Through this *Act* LWBC issues tenures for shellfish aquaculture and manages those tenures. Figure 26 and Planning Unit maps identify existing tenures which continue subject to tenure conditions, regardless of the provisions in this Plan.

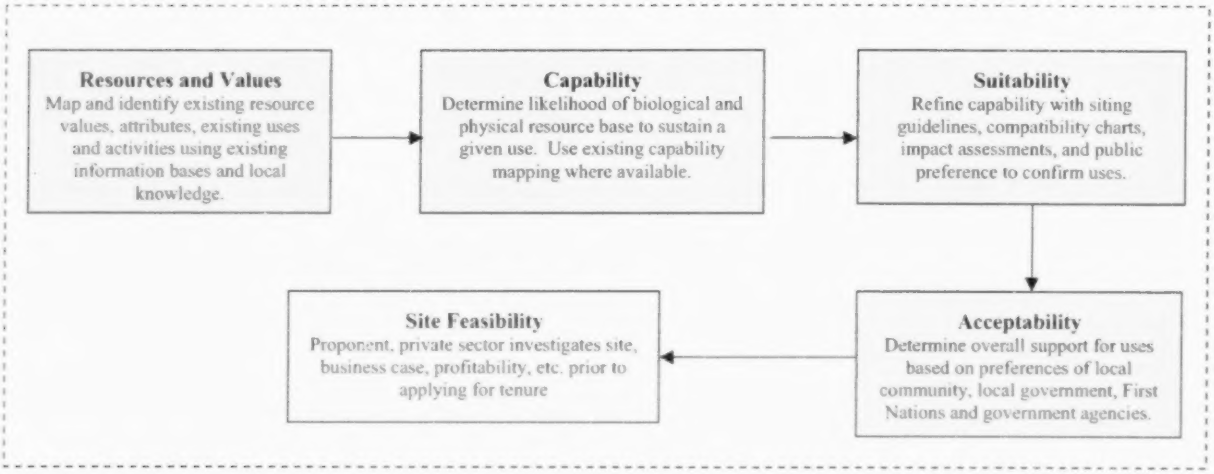
This Plan makes recommendations regarding the acceptability of applications for shellfish aquaculture for each Planning Unit. Acceptability of uses is addressed according to the coding shown in Table 9.

Table 9. Acceptability Coding for Shellfish Aquaculture

✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. New applications for this use should not be accepted for processing and evaluation.

3.6 Determination of Areas Acceptable for Tenure Application

A number of decision rules were used to initially determine where shellfish aquaculture tenure applications would be acceptable. These rules included shellfish aquaculture biophysical capability, existing use commitments, compatibility with other uses, agency siting requirements and best management practices. The initial determination was then refined to reflect feedback received during review and discussion with the public, local Advisory Committee members and stakeholder groups. This feedback combined with RDCS, First Nation and other government agency input resulted in a determination of whether the shellfish culture tenure applications are deemed Acceptable, Conditionally Acceptable or Not Acceptable in the Plan. This process is identified conceptually in Figure 26.



Resources and Values
Map and identify existing resource values, attributes, existing uses and activities using existing information bases and local knowledge.

Capability
Determine likelihood of biological and physical resource base to sustain a given use. Use existing capability mapping where available.

Suitability
Refine capability with siting guidelines, compatibility charts, impact assessments, and public preference to confirm uses.

Acceptability
Determine overall support for uses based on preferences of local community, local government, First Nations and government agencies.

Site Feasibility
Proponent, private sector investigates site, business case, profitability, etc. prior to applying for tenure

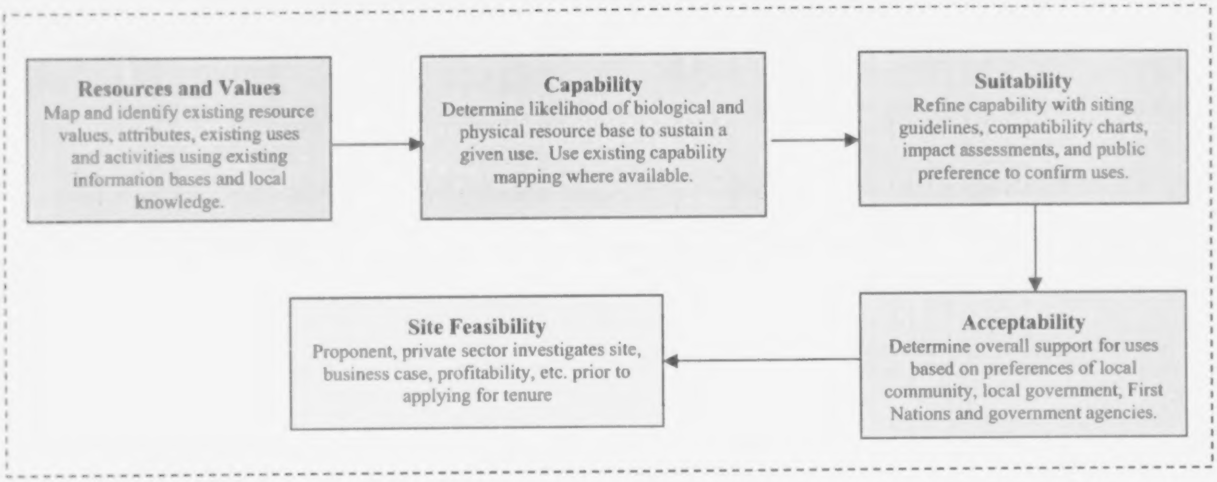
Figure 26. Generalized Approach to Determining Acceptable Shellfish Aquaculture Applications.

It is important to note that, although a type of shellfish culture may be considered acceptable or conditionally acceptable in this Plan within any planning unit, or rated as good or medium for aquaculture capability, these are general indicators at a broad scale and do not assume that every site in the area would be biophysically capable for shellfish culture. Site-specific factors, such as wind and wave action at exposed sites, could mitigate against successful aquaculture. Such factors would require evaluation at the site feasibility assessment stage. Also, agency assessments of a site-specific tenure application review stage could result in non-approval of that application.

3.7 Management Conditions and Guidelines

The Plan provides management conditions and/or guidelines for each planning unit. Where shellfish culture has been deemed "Conditionally Acceptable", management conditions identify requirements that must be met by applicants before LWBC will consider accepting tenure and License applications . These conditions must be fulfilled in addition to existing routine agency requirements for any application. Management guidelines are designed to provide guidance for siting, managing and operating shellfish aquaculture facilities whether shellfish aquaculture is deemed "Acceptable" or "Conditionally Acceptable". The final conditions and guidelines for each planning unit have been influenced by knowledge, information and advice from RDCS, First Nations, other government agencies, area residents, and other interested parties.

This Plan provides broad guidance on where applications for shellfish culture are more likely to receive approval, but does not guarantee that applications will be tenured or licensed. More detailed information, considerations, consultations and agency conditions may be required at the site-specific application stage than were available, used or developed for this Plan. Appendix 4 outlines Decision Tools for Accepting Shellfish Aquaculture Applications, and Guidelines for Siting and Best Management Practices. The siting and best management practices apply in addition to any provisions in this Plan.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Determine overall support for uses based on preferences of local community, local government, First Nations and government agencies.
Site Feasibility
Proponent, private sector investigates site, business case, profitability, etc. prior to applying for tenure

Figure 26. Generalized Approach to Determining Acceptable Shellfish Aquaculture Applications.

It is important to note that, although a type of shellfish culture may be considered acceptable or conditionally acceptable in this Plan within any planning unit, or rated as good or medium for aquaculture capability, these are general indicators at a broad scale and do not assume that every site in the area would be biophysically capable for shellfish culture. Site-specific factors, such as wind and wave action at exposed sites, could mitigate against successful aquaculture. Such factors would require evaluation at the site feasibility assessment stage. Also, agency assessments of a site-specific tenure application review stage could result in non-approval of that application.

3.7 Management Conditions and Guidelines

The Plan provides management conditions and/or guidelines for each planning unit. Where shellfish culture has been deemed “Conditionally Acceptable”, management conditions identify requirements that must be met by applicants before LWBC will consider accepting tenure and License applications . These conditions must be fulfilled in addition to existing routine agency requirements for any application. Management guidelines are designed to provide guidance for siting, managing and operating shellfish aquaculture facilities whether shellfish aquaculture is deemed “Acceptable” or “Conditionally Acceptable”. The final conditions and guidelines for each planning unit have been influenced by knowledge, information and advice from RDCS, First Nations, other government agencies, area residents, and other interested parties.

This Plan provides broad guidance on where applications for shellfish culture are more likely to receive approval, but does not guarantee that applications will be tenured or licensed. More detailed information, considerations, consultations and agency conditions may be required at the site-specific application stage than were available, used or developed for this Plan. Appendix 4 outlines Decision Tools for Accepting Shellfish Aquaculture Applications, and Guidelines for Siting and Best Management Practices. The siting and best management practices apply in addition to any provisions in this Plan.

3.8 Planning Unit Direction

Unit 1 Cortes Island North

Marine Area	1297 ha	**Shoreline**	16 km
Substrate	Mud	**Slope**	Sloping
Exposure	Low	**Depth**	Deep
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Low		

Description:

This unit is dominated by a long peninsula and narrow rocky shorelines, with a few relatively exposed areas. There are few nearshore uses due to the rocky shoreline and narrow waterways, which serve as a major transportation route for recreational and commercial vessels.

Unit Attributes:

- Nearshore Habitat: predominately rocky shore habitat, a few sand and gravel pocket beaches and relatively long gravel beach (due west of Teakerne Arm).
- Wave exposures are relatively low (protected) except at a few locations where wave fetches >10 km occur (e.g. northern tip).
- Currents are reportedly low in Lewis Channel (<2knots).
- Area appears to be influenced by runoff from Toba and Bute Inlets.
- Offshore seabed relief is relatively uniform and seabed sediments in deeper water appear to be mud.
- Intertidal clam beach (1 identified).
- Southern portion of Lewis Channel adjacent to Teakerne Arm confirmed by CWS as a migratory bird area.
- Eelgrass bed (1 identified) in pocket beach (local knowledge).

Current Uses and Activities:

- Shellfish tenures (1 beach site and 1 combined beach and off-bottom site collectively occupying 8.08 ha). Data unavailable for relative amount of beach occupied by the combined tenure.
- Council of Marine Carriers tow boat reserves (2)
- Prawn fishing, urchins
- High use area for pleasure craft in the late spring, summer and early fall periods due to direct route and visual quality (local knowledge)
- Sutil and Lewis Channels are major transportation routes for both commercial and recreational vessels (local knowledge)
- Unit lies within traditional territory of Klahoose and Homalco First Nations; approximately northern half of the unit also lies within Statement of Intent area for the Hamatla Treaty Society

Issues and Concerns:

- Residents report the area is subject to westerly and northeasterly winds that cause rough water and that Lewis Channel is affected by polar outflow winds from Bute Inlet. Operators indicate that this mitigates against the successful operation of off-bottom sites. Some residents, including operators have indicated that off-bottom development may be possible, but only if culture systems designed to withstand higher wave action are employed, but this remains unproven.

- Residents have indicated that use of machinery that causes noise and visual disturbance should be restricted to northern areas of Cortes Island, including this unit. However, wave exposure may rule out any potential for off-bottom development here.
- Ministry of Forests has identified several sites of interest to the forest industry for log handling in this Unit. These are identified on the Local Knowledge map in the Resource Maps for this Plan. Some of these areas of interest coincide with existing tenures or reserves for other uses. Potential for conflict with shellfish interests would need to be addressed by LWBC at the site-specific application stage.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
✓	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Guidelines:

- Maintain *Land Act* Notations of Interest (2) in Lewis Channel in favour of Council of Marine Carriers and Coast Guard for tow boat safe anchorage purposes.
- Shellfish tenure applications for the Lewis Channel area adjacent to Teakerne Arm should be referred to the CWS.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- Tenured uses should avoid interference with navigation.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.
- Proponents should account for wave exposure if conducting feasibility studies for off-bottom culture in this unit.

Unit 2 Sutil Channel

Marine Area	1409 ha.	**Shoreline**	35 km
Substrate	Mud	**Slope**	Sloping
Exposure	Low	**Depth**	Mid-Depth
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Moderate		

Description:

- This unit consists of a portion of the northern shoreline of Sutil Channel, adjacent to Von Donop Provincial Marine Park (new commercial tenures not allowed within Provincial Parks). The unit contains a mixture of bedrock shores, small pocket beaches and is used predominantly for shellfish culture, recreation and tourism.

Attributes:

- Nearshore Habitats: Rocky shore and small protected bay habitats.
- CWS Confirmed Area of Use for migratory birds along whole shoreline of unit.
- Intertidal clam beaches (4 identified);
- Eelgrass beds (1 identified) (local knowledge)
- Herring spawn: Shoreline north of Quartz Bay

Current Uses and Activities:

- Campsites (2) (campsites could be provincial, regional or private and may include undeveloped kayak campsites)
- Safe anchorage (1) in the bay north of the entrance to Von Donop Inlet
- Shellfish aquaculture tenures (2 off-bottom and 2 combined beach and off-bottom tenures collectively occupying 7.79 ha.). No data available on relative portions of beach to off-bottom occupied by the combined tenures.
- FOC has identified the small clam beach near the outlet of Robertson Lake as highly productive and used for commercial/recreational harvesting.
- Area important for pleasure and tour boating (local knowledge)
- Unit lies within traditional territories of Klahoose and Homalco First Nations and within Statement of Intent area for Hamatla Treaty Society.

Issues and Concerns:

- Residents report the area is subject to strong westerly and northeasterly winds that cause rough water. Operators indicate that this mitigates against the successful operation of off-bottom sites. Some residents, including operators have indicated that off-bottom development may be possible in exposed areas, but only if culture systems designed to withstand higher wave action are employed, but this remains unproven.
- Residents have indicated that use of machinery that causes noise and visual disturbance should be restricted to northern areas of Cortes Island, including this unit. However, wave exposure may rule out any potential for off-bottom development here.
- Recreation and tourism operators indicate that a priority should be placed on maintaining visual quality.
- Ministry of Forests has identified several sites of interest to the forest industry for log handling in this Unit. These are identified on the Local Knowledge map in the Resource Maps for this Plan. Some of these areas of interest coincide with existing tenures or reserves for other uses. Potential

for conflict with shellfish interests would need to be addressed by LWBC at the site-specific application stage.

- Siting of beach and off-bottom culture near camping areas may increase the risk of bacterial contamination of shellfish.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
O	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Conditions:

- Applications for off-bottom culture are conditional on the provision of measures that meet the enforceable provisions in the Provincial Code of Practice for Shellfish Aquaculture to minimize visual impacts.

Management Guidelines:

- Shellfish tenure applications in this Unit should be referred to CWS.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to the safe anchorage in the bay north of the entrance to Von Donop Inlet.
- New tenures should minimize disturbance to herring spawn and fishing when they occur on the shoreline north of Quartz Bay.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 3 Carrington Bay

Marine Area	1043 ha	**Shoreline**	23 km
Substrate	Mud	**Slope**	Sloping
Exposure	Low	**Depth**	Mid-Depth
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Moderate		

Description:

This unit contains Carrington Bay and Carrington Lagoon as well as the shorelines of Sutil Channel, extending from Quartz Bay to Subtle Island. North facing shores are predominantly rocky and offshore areas are predominantly muddy. The area is characterized by high biological values and a diversity of commercial and recreational uses.

Attributes:

- Nearshore Habitats: Rocky shore and protected bay habitats, some tidal flat habitat
- North-facing shore dominated by bedrock-controlled shores, a few sand and gravel flats and an unusual salt lagoon, which fills at the highest part of the tide, at the head of Carrington Bay
- Exposures are moderate on the outer shores (wave fetch distance >10 km) and large driftwood piles at the mouth of Carrington Lagoon are indicative of occasional storms
- Most of the offshore is muddy (local knowledge)
- Entire outer shoreline of Sutil Channel is a CWS Confirmed Area of Use for Migratory Birds
- Eelgrass (5-identified) (local knowledge)
- Herring spawn: southern shores of Carrington Bay, Quartz Bay
- Shellfish deep water capability: oyster and scallop, Good or Moderate throughout Carrington Bay and Coulter Bay
- Area designated as a No Discharge Zone under Pleasure Craft Sewage Discharge Regulations
- Shellfish beach culture capability: clam and oyster, Good in Coulter Bay and adjacent bays approximately 1km south and 1km north of Coulter Bay
- Intertidal clam beaches (3 identified);
- Sutil Channel has been identified as a prime day use area by recreation and tourism operators
- Areas of High Biodiversity: Coulter Island, Plunger Passage

Current Uses and Activities:

- Shellfish aquaculture tenures(4 beach sites occupying a total of 7.25 ha, 1 off-bottom site occupying .74 ha and one combined beach and off-bottom site occupying 9.81 ha)
- Safe anchorages (3) at Quartz, Carrington Bay and Coulter Bay
- Campsites (3) at Carrington Bay, Coulter Bay and small bay south of Coulter Bay (campsites could be provincial, regional or private and may include undeveloped kayak campsites).
- Regional Park over Carrington Bay.
- FOC has identified the beaches in Carrington and Coulter Bay as highly productive, and used, for commercial/recreational harvesting.
- Unit lies within traditional territories of Klahoose and Homalco First Nations and within Statement of Intent Area for the Hamatla Treaty Society

Issues and Concerns:

- Residents have indicated that Carrington Bay receives heavy westerly winds, resulting in rough water which may require culture systems designed to withstand higher wave action for off-bottom sites.

- Residents have indicated that beaches in this area are important for commercial clam digging and the advisory committee has recommended that these beaches be maintained for that use.
- Siting beach and off-bottom culture near camping areas may increase the risk of bacterial contamination of shellfish.
- FOC has indicated that there may be a potential for conflict with high biodiversity values in Carrington Bay, if not avoided during shellfish aquaculture siting.
- FOC has indicated that Coulter Bay is subject to annual shellfish harvesting closures due to bacterial contamination.
- There is a higher potential for conflicts between shellfish culture and recreational uses in Carrington Bay, than in many other parts of the Plan Area, given its status as a Regional Park.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
O	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Conditions:

- Off-bottom culture applications are acceptable only outside of Carrington Lagoon due to shallow depths.
- Applications for off-bottom culture in Carrington Bay are conditional on the provision of measures that meet the enforceable provisions in the Provincial Code of Practice for Shellfish Aquaculture to minimize visual and noise impacts.

Management Guidelines:

- Tenure applications in this Unit should be referred to the CWS.
- Tenure applications within the Carrington Bay Regional Park should be referred to the RDCS.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to safe anchorages in Quartz, Carrington and Coulter Bays.
- New tenures should minimize disturbance to herring spawn and fishing when they occur on the southern shores of Carrington and Quartz Bay.
- New tenures should minimize disturbance to high biodiversity values in Carrington Bay.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.

- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.
- Applicants should consider that Coulter Bay is subject to annual harvesting closures by FOC due to contamination and as a result may not be suitable for development, unless water quality improves.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 4 Marina Island

Marine Area	3763 ha	**Shoreline**	45 km
Substrate	Mud	**Slope**	Sloping
Exposure	Low	**Depth**	Photic
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Low		

Description:

The Marina Island portion of this unit has the largest component of sedimentary beaches in the area. Sand and gravel beaches are common along much of the Cortes Island shoreline in this unit with wide sand flats south of Manson's Landing. The unit supports a high number of recreational uses, biological values and commercial uses, including several shellfish aquaculture tenures.

Attributes:

- Marina Island: a large glacial deposit being eroded by storm waves from the southeast.
- There are very wide erosional flats (e.g., Marina Reef), typically with a veneer of boulder and cobble over sand
- High wave exposures that occur on the southern shore of Marina Island and the abundance of glacial sediments make this area more dynamic and complex.
- Severe north/northwest wind and wave action reported on west facing shores (local knowledge)
- Nearshore Habitats: predominately beach and tidal flat habitat
- Lagoon at Manson's Landing is reported to be mostly sand and mud substrate.
- Shark Spit to the north: composed of deposited and eroded sand-sized sediment
- Northern point of Marina Island (Shark Spit) CWS Confirmed Area of Use by migratory birds
- Large intertidal clam beaches (3 identified)
- Seal and/or sea lion haul out or rafting site (5 identified)
- Salmon Streams at Mason's Landing and Whaletown (2 identified)
- Extensive eelgrass beds (17 identified) (local knowledge)
- Shellfish Deepwater capability: oyster and scallop Good or Moderate extending from Subtle Islands to Deadman Island including the northern shores of Marina Island
- Shellfish Beach Capability: clam and oyster Good or moderate extending from Subtle Islands to Deadman Island including the northern shores of Marina Island
- Areas of high marine biodiversity: Plunger Passage, Manson's Landing and Gorge Harbour entrance, Marina Reef
- Area designated as a No Discharge Zone under Pleasure Craft Sewage Discharge Regulations
- Herring Spawn: Southern shoreline of Marina Island, Whaletown Bay
- High biological values along western and southern shores of Marina Island, including Marina Reef
- Pacific Sand lance spawning Habitat has been observed along the northern shores of Marina Island (Shark Spit).

Current Uses and Activities:

- Indian reserve: Sliammon, 1km south of Manson's Landing.
- Campsites (1) at Shark Spit (campsite could be provincial, regional or private or undeveloped kayak campsite).
- Safe anchorages (2) at Whaletown Bay and Manson's Landing
- Shellfish aquaculture tenures (17 beach sites occupy a total of 33.21 ha. and 2 sub-tidal geoduck sites occupying 21.34 ha.). This unit supports the largest cumulative area tenured beach culture in the Plan Area (compared to the next most developed area which is Squirrel Cove with 22.2 ha of beach tenure) and is the single most developed area for aquaculture in terms of overall tenured area. Beach culture and sub-tidal culture together add up to 54.55 ha. compared to a total of just over 124 ha. for the whole Plan Area.
- This is the only unit within the Plan supporting existing sub-tidal culture tenures.
- UREP (*Land Act* Notation) at Uganda Passage
- Manson's Landing Provincial Marine Park.
- Private Moorage (9)
- Public Wharf (2) BC Ferry dock at Whaletown Bay
- Boat Launch (1) at Manson's Landing
- High use area for recreational and commercial boating
- Unit lies within traditional territories of Klahoose, Sliammon and Homalco First Nations.

Issues and Concerns:

- Marina Reef is one of only a few highly diverse ecosystems of this character in British Columbia Waters (local knowledge).
- Strong interest has been expressed by residents in designation of Marina Island Reef at the southwest end of Marina Island (circled area on unit map indicates general location) as a Marine Protected Area (MPA). The RDCS Regional Board signed a resolution in 1998 that this area be designated as a future MPA.
- There may be potential for conflict with boat traffic in high boat use areas.
- FOC has indicated there may be potential for conflict with high biodiversity values in Plunger Passage, if not avoided during shellfish aquaculture siting.
- FOC has indicated that Whaletown Bay is subject to annual, and Manson's Landing to seasonal, shellfish harvesting closures due to bacterial contamination.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
X	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Guidelines:

- Maintain *Land Act* Notation of Interest over UREP at Uganda Passage in favour of WLAP for marine conservation and recreation purposes, and include in future marine conservation assessment.
- Establish *Land Act* Notation of Interest over Marina Island Reef in favour of WLAP for marine conservation and recreation purposes, and include in future marine conservation assessment.
- Tenure applications in the Shark Spit area (the northern point of Marina Island) should be referred to the CWS.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to safe anchorages at Whaletown Bay and Manson's Landing.
- New tenures should minimize disturbance to herring spawn and fishing when they occur on the southern shore of Marina Island and Whaletown Bay.
- Applicants should consider that Whaletown Bay and Manson's Landing are subject to annual and seasonal harvesting closures, respectively, by FOC due to contamination and as a result may not be suitable for development, unless water quality improves.
- New tenures should minimize disturbance to high biodiversity values in Plunger Passage.
- New tenures should be located and operated in a manner that minimizes conflict with sea lion and seal haul outs/ rafting sites (1 at north end of unit and 4 near Marina Island).
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.
- New tenures should be operated in a manner and during time windows that minimize disturbance to sand lance spawning.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 5 Gorge Harbour

Marine Area	364 ha	**Shoreline**	16 km
Substrate	Mud	**Slope**	Sloping
Exposure	Moderate	**Depth**	Photic
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Low		

Description:

Gorge Harbour is a large enclosed harbour with a narrow entrance (the Gorge) and is the smallest planning unit within the Plan Area. The harbour's south side is characterized by bedrock and sand & gravel beaches and the north side by sand or sand & gravel beaches. The harbour proper has a generally muddy seabed, limited water depths (less than 35m) and elevated summer water temperatures due to restricted water exchange.

The area is recognized for its high biological productivity and values, intensive commercial, recreational and private uses and ideal biophysical conditions for shellfish culture. The upland surrounding the Harbour is well developed with permanent residences, cottages and summer homes, particularly along the northern and north eastern shores. There has also been some residential development along the southern shore just east of the Gorge entrance. Much of the land immediately surrounding Gorge Harbour is privately owned with a mixture of private and Crown land away from the immediate vicinity of the Harbour.

Attributes:

- The distinguishing features of Gorge Harbour are low wave exposures that provide all-weather protection, and the narrow bedrock entrance (the Gorge) where currents can exceed 4 knots.
- Nearshore Habitats: mix of beach and protected inlet habitats
- Shellfish deepwater capability: oyster and scallops Good or Moderate throughout
- Shellfish beach capability : Good in various bays
- Salmonid streams (3 reported, two of which are local knowledge)
- Sea run cutthroat trout (local knowledge)
- High bird values (local knowledge)
- Area of High Marine Biodiversity: (1) The Gorge
- Area designated as a No Discharge Zone under Pleasure Craft Sewage Discharge Regulations
- Entrance to the Gorge and Gorge Harbour are areas of high visual quality
- Area of use by migratory birds (local knowledge)
- Important habitat for many juvenile fish species (local knowledge)
- Marina provides the only marine fuel supply for Cortes as well as amenities to boaters and general public

Current Uses and Activities:

- Shellfish aquaculture tenures (15 beach culture sites occupying 16.44 ha and 7 off-bottom sites occupying 13.25 ha.(two of the off-bottom tenures contain small beach culture areas)
- This unit supports the largest cumulative area (about 13 ha.) covered by off-bottom culture tenures compared to the next most developed area, planning unit 6, which has 3.13 ha tenured for off-bottom culture. This compares to a total of 20 to 24 ha. of off-bottom tenure for the whole Plan Area and reflects the desirability and capability of Gorge Harbour to the industry for off-bottom culture purposes.
- There are currently 321 rafts present.
- Private Moorage (8)

- Light industrial (2)
- Log handling site (1)
- Marina (1)
- Campsites (1) Private at Gorge Harbour Marina
- Safe anchorage areas throughout Gorge Harbour
- Major transportation route for commercial, local and tourist vessels.
- A seaplane flight path has been identified in the south east portion of the Harbour (local knowledge).
- Primary recreation area (local knowledge)
- Unit lies within traditional territories of Klahoose, Sliammon, and Homalco First Nations.

Issues and Concerns:

- The BC Shellfish Growers Association would like the Province to give Gorge Harbour a priority as a shellfish aquaculture development area and recognize the industry there as environmentally sustainable.
- Upland residents state that existing operations cause noise, visual and smell disturbance from shellfish aquaculture farm equipment, and should be reduced.
- Some Island residents want no further industry expansion, whereas others are prepared to accept some limited expansion of existing operations provided they do not involve use of machinery and provided the facilities are locally owned and operated.
- A biological carrying capacity study conducted by scientists from Washington State and involving a MAFF scientist in 2002 indicates that, from a purely biological perspective, the area could support an additional 1151 rafts without impacting plankton production in the Harbour (i.e. reducing plankton production in the Harbour to levels equivalent to those outside the Harbour). Some Island residents have incorrectly interpreted the 1151 as a Plan target. This is a biological carrying capacity estimate made independently of this planning process.
- Residents have expressed concern that the carrying capacity study did not include measurements of dissolved oxygen, sediment redox potential and sedimentation and would like to see some additional attention placed on those parameters. (Note: Independently from this Planning process, Malaspina University College, Center for Shellfish Research, has received funding from the BC Aquaculture Research and Development Council to conduct research on shellfish culture and particulate matter production and cycling. One of the study sites will be in Gorge Harbour and will include redox and dissolved oxygen studies for one year until the summer of 2004).
- Some residents have indicated that there is a legal flight path, not indicated on the planning unit map, for float planes in Gorge Harbour south of Tan Island, which could be potentially impacted by new aquaculture development. However, there is no federal or provincial record of this as a legally sanctioned right of way or tenure, although there is no prohibition of such use in the area.
- Three resident shellfish growers have expressed interest in tenure expansion and one operator wishes to increase the number of rafts within the existing tenure. Two of the resident growers indicated that they have been held back from expanding for several years and this has represented a financial cost.
- Klahoose First Nation is interested in two new off-bottom sites in the Harbour, one in the southeast portion and one in the southwest portion.
- One non-First Nation group has expressed interest in one new off-bottom site in the Harbour.
- The Gorge Harbour Marina Resort, which is the major tourism operator in the Harbour, does not want further shellfish expansion on the concern that visual and noise impacts will increase which in turn will reduce tourism and related economic activity for the resort and the Island.
- A number of tenure holders have been operating out of compliance with their tenure and zoning requirements. Residents have for some time been advocating that provincial agencies and the

Regional District should immediately address this issue along with noise visual and smell disturbance associated with one or two existing operations.

- Provincial and local government agencies are aware of widespread industry non-compliance in Gorge Harbour with tenure, Management Plan or zoning requirements, based on a number of provincial inspections, the most recent in July 2003, as well as an aerial photography and mapping exercise in 2001. An investigation by WLAP concerning one operation was also commenced in the spring 2003, but separate from the planning process. The agencies, including the Regional District, have been awaiting completion of the Plan before addressing these issues directly on the understanding that the Plan will provide guidance on appropriate areas for shellfish aquaculture. Unauthorized uses that are not consistent with the Plan will be managed by the appropriate agency. A number of property owners on the Gorge Harbour upland have expressed dissatisfaction at this approach.
- Upland residents oppose new off-bottom culture development in the south east portion of Gorge Harbour south of Tan Island. This includes the seaplane flight path.
- RDCS requested support for development of a sewage pump-out station. Some residents oppose this request, stating a station is not practicable, but advocate one for Squirrel Cove instead.
- Beaches available for expansion of beach culture are limited in this unit.
- Residents report litter accumulation on the beach at the west end of the harbour. Routine beach clean-ups organized by some shellfish growers have been successful.
- Area residents and some members of the advisory committee do not want any expansion or new development to interfere with safe anchorages which they indicate exist throughout the Harbour..
- RDCS and the Friends of Cortes Island indicate that Gorge Harbour has high marine biodiversity and is a designated marine sensitive area..
- A number of residents indicated that some existing docks are not depicted on the planning unit maps. Only legally tenured private wharves and/or dock locations are depicted on the planning unit map as "PM" (for "Private Moorage"). Non legal private moorage owners risk enforcement action from LWBC if they do not apply for tenure.
- Some residents have expressed concern that there is a cumulative effect of shellfish aquaculture operations together on the Gorge Harbour ecosystem. Provincial agencies are currently discussing ways to conduct a comprehensive review of all the tenure applications for Gorge Harbour together.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
O	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Conditions:

- Applications for expansion of existing or new off-bottom tenure are conditional on provision of measures that meet the enforceable provisions in the Provincial Code of Practice for Shellfish Aquaculture to minimize visual, noise and smell disturbance.

- The total number of rafts for existing off-bottom operations in Gorge Harbour (including expansions resulting from this Plan) is capped at 467 for all existing tenures combined. This means that applications could be accepted for an additional 146 new rafts within existing tenures or through expansions of existing tenures. These 146 rafts would be in addition to the 321 rafts already in the Harbour. The area of each tenure will reflect the individual requirement for rafts and anchoring systems, as well as related facilities.
- Only one application should be accepted for a new First Nations off-bottom aquaculture tenure in the area of interest noted on the planning unit map (near mouth of large bay on south side of the Harbour, immediately west of the Gorge). This is one of the areas of interest indicated by the Klahoose First Nation.
- The total number of rafts for the new First Nations off-bottom operation in Gorge Harbour is capped at 90 rafts. The area of tenure will reflect the individual requirement for rafts and anchoring systems, as well as related facilities.
- The total number of existing and allowable new rafts in the Harbour (including 146 for expansions and 90 for one new tenure) is capped at 557.

Management Guidelines:

- Further placement of rafts at existing operations, whether on existing tenures or on expanded tenures should only occur after completion of provincial agency inspection and enforcement actions which satisfactorily address Crown land tenure non-compliance (i.e. unauthorized occupation of Crown foreshore) and Management Plan inconsistencies related to existing operations in the Harbour.
- Placement of rafts on the new off-bottom tenure should only occur after completion of provincial agency inspection and enforcement actions which satisfactorily address Crown land tenure non-compliance (i.e. unauthorized occupation of Crown foreshore) and Management Plan inconsistencies related to existing operations in the Harbour.
- Each tenure in the Gorge should be allowed a single barge from which growers can conduct their operations.
- LWBC should fairly determine how many out of the 146 available rafts to allocate for each expansion proponent.
- LWBC should provide one time window for existing operators to apply for tenure expansion.
- LWBC should consider the Klahoose First Nation as a priority applicant for development of the one new off-bottom site.
- LWBC should hold a public meeting on Cortes Island to review applications for proposed expansion and one new tenure.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to safe anchorage.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 6 Cortes Island South

Marine Area	2174 ha	**Shoreline**	32 km
Substrate	Mud	**Slope**	Sloping
Exposure	Moderate	**Depth**	Photic
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Low		

Description:

This unit consists of Sutil Point Peninsula, Twin Islands and Cortes Bay. The Peninsula holds a high number of biological values while the Twin Islands and Cortes Bay contain a high concentration of recreational and private uses with some limited shellfish culture. There are a few areas of good and medium capability for shellfish culture.

Attributes:

- Sutil Peninsula: glacial deposit and erosion have created wide flats with boulder/cobble veneers and a few depositional areas with sand beaches (e.g., Smelt Bay)
- Sutil Peninsula: one of the more exposed portions of Cortes Island, with open fetches to the Strait of Georgia
- Nearshore habitats: predominately beach and tidal flat, some rocky shore and protected inlet habitat (Twin Islands and Cortes Bay area)
- Twin Islands and Cortes Bay: more typical mixture of bedrock shores and sand & gravel beaches
- Sedimentary rocks that crop out along the west shore of the Twin Islands contrast with the granitic rocks found on the remainder of the Cortes Island shoreline
- Considerable offshore relief around Twin Islands and near Cortes Bay suggests that the seabed is a mixture of rock shoals and channels with mud/sand covers
- Cortes Bay: very sheltered shores and exposures lower than Sutil Point
- Entire unit a CWS Confirmed Area of Use by migratory birds
- Documented marine bird breeding; Little Rock, Three Islets
- Large intertidal clam beaches throughout entire shoreline of Sutil Point.
- A stream that flows through "Cliff's Lagoon" onto the Cortes Island beach near Sage Island attracts chum salmon and could be rehabilitated as a salmon spawning creek (local knowledge).
- Cortes Bay: a prime tourism destination by recreational tourism operators (local knowledge)
- Herring spawn: Smelt Bay
- Shellfish Deepwater capability: rated Good, Oysters and Scallops in Cortes Bay
- Shellfish Beach capability: rated Medium, clams and scallops
- Seal/Sea lion haul outs: Little Rocks (2), Sutil Point (1)
- Extensive eelgrass beds (14 identified)
- High marine species diversity: offshore of Sutil Point
- Cortes Bay Area is designated as a No Discharge Zone under Pleasure Craft Sewage Discharge Regulations
- Sutil Point Reef is one of only a few highly diverse ecosystems of this character in British Columbia waters (local knowledge).
- The clam beach located on Cortes Island northwest of Twin Islands in the small bay behind the locally termed "Goat Island" or "Sage Island" is subject to heavy wave action from south easterly winds due to exposure (local knowledge).

Current Uses and Activities:

- Shellfish Aquaculture: (1 beach tenure of 3.74 ha and 1 off-bottom site of 3.13 ha.)
- Private moorage: (8)
- UREP area south of Cortes Bay
- Marina (1): Cortes Bay
- Boat Launch (2): Cortes Bay and Sutil Peninsula
- Campsites (1): Sutil Peninsula (provincial)
- Public Wharf (1): Cortes Bay
- Commercial tenure (1): seasonal use
- Safe anchorages (5): 1 in Cortes Bay and 4 on Twin Islands
- Area important for commercial clam harvests (local knowledge)
- FOC has identified the two beaches near the northeast portion of the unit (Goldmine Bay) as highly productive, and used, for commercial/recreational beaches.
- The clam beach located on Cortes Island northwest of Twin Islands in the small bay behind the locally termed “Goat Island” or “Sage Island” and the long beach immediately west of the locally termed “Cliff's Lagoon” beach have been identified as important for recreational clam harvesting area (local knowledge).
- Unit lies within traditional territories of Klahoose, Sliammon, and Homalco First Nations

Issues and Concerns:

- The Vancouver and Seattle Yacht clubs oppose shellfish aquaculture applications for Cortes Bay on the grounds that they may conflict with existing intense recreation, tourism and boat use of the area.
- The outer portion of Cortes Bay, except for the area behind the small island at the east end of the bay, may be subject to relatively heavy wave action due to exposure. This may affect the acceptability of the area for off-bottom culture.
- FOC has indicated that Cortes Bay is subject to seasonal shellfish harvesting closures due to bacterial contamination.
- The advisory committee and some residents of Cortes Island would like beaches historically used for wild clam harvest maintained for that purpose.
- The Klahoose First Nation has expressed interest in beach culture in Gold Mine Bay (2 small bays at the east of end of Cortes Bay).
- Strong local interest in designation of Sutil Point Reef (circled area on planning unit map) as a Marine Protected Area (MPA). The RDCS Regional Board signed a resolution in 1998 that this area should be designated as an MPA.
- Several residents have requested that the clam beach located on Cortes Island northwest of Twin Islands in the small bay behind the locally termed "Goat Island" or "Sage Island" not be made available for shellfish culture.
- Residents are concerned that aquaculture development near the stream that flows into this area would compromise the potential for rehabilitation of this stream as a chum salmon stream.
- Residents have indicated concern that potential shellfish culture may impact access to Smelt Bay

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
O	Shellfish Beach Aquaculture
O	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Conditions:

- Applications for beach and off-bottom culture are conditional on the sites being located outside of the interior basin of Cortes Bay, and outside of Smelt Bay.
- Applications for off-bottom culture in the outer portion of Cortes Bay are conditional on inclusion of measures that meet the enforceable provisions in the Provincial Code of Practice for Shellfish Aquaculture to minimize visual, noise and smell disturbance.

Management Guidelines:

- Establish *Land Act* Notation of Interest over Sutil Point reef in favour of WLAP for conservation and recreation purposes, and include in a future marine conservation assessment.
- Maintain *Land Act* UREP south of Cortes Bay in favour of WLAP for conservation and recreation purposes, and include marine portion in a future marine conservation assessment.
- Applicants should consider that Cortes Bay is subject to seasonal harvesting closures by FOC due to contamination and as a result may not be suitable for development, unless water quality improves.
- Shellfish tenure applications in this Unit should be referred to the CWS.
- New tenures should be located and operated in a manner that minimizes conflict with Little Rock and Three Islands bird colonies.
- New tenures should be located and operated in a manner that minimizes conflict with sea lion and seal haulouts/ rafting sites off Sutil Point and the Twin Islands.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to safe anchorages around Twin Islands or access to Smelt Bay.
- New sub-tidal shellfish aquaculture tenures should minimize conflicts with sub-tidal wild shellfish harvests.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.

- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 7 Strait of Georgia

Marine Area	670 ha	**Shoreline**	5 km
Substrate	Mud	**Slope**	Sloping
Exposure	Moderate	**Depth**	Moderate
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Moderate		

Description:

This unit encompasses a short length of the Twin and Cortes island shoreline. It includes predominately offshore habitat, rocky nearshore habitats and some gravel flats at the north end within bays and at Mary/Turn Points. Uses in the area consist of recreational use, wild clam harvests and, at one time, a shellfish beach aquaculture site in the Mary/Turn Point area.

Attributes:

- Mary Point area of Cortes Island consists of a series of rock cliff headlands with sand and gravel flats at the heads of the associated bays
- CWS Area of Use by migratory birds: entire unit
- Shellfish Deepwater Capability: good or moderate off Turn Point
- Shellfish Beach Capability: Good or Moderate off Turn Point
- Historic herring spawning around Mary Point
- Eelgrass beds (2 identified)
- Seal/ Sea lion haul out: Iron Point off Twin Islands

Current Uses and Activities:

- No existing complete shellfish aquaculture tenures although 1 beach tenure was previously farmed at Turn Point. South tip of one beach tenure from Planning Unit 8 is in this Unit.
- Intertidal clam beaches: Mary/Turn Point bays identified by DFO as highly productive, and used, for commercial and recreational purposes.
- First Nations interest in shellfish opportunities in Turn Point area.
- Campsites (1) (campsite could be provincial, regional or private or undeveloped kayak campsite)
- Marine and telecommunications utility crossing northeast end of unit.
- Turn Point previously held one beach tenure; currently the site is vacant.
- Unit lies within traditional territories of Klahoose, Sliammon, and Homalco First Nations.

Issues and Concerns:

- Both the Klahoose and Sliammon First Nations have expressed interest in developing a beach culture site at Turn Point.
- A number of upland owners object to new beach culture on beaches fronting their private property on the understanding that aquaculture tenure would preclude wild recreational harvesting. Upland owner consent is required for tenure applications immediately adjacent to private upland property, if the proposed use has the potential to impede riparian rights to access.
- A number of residents, including members of the Advisory Committee and the Hollyhock Resort have stated that remaining beaches used for commercial or recreational wild clam harvest should not be tenured for shellfish beach culture.
- Applicants for off-bottom culture may wish to note that there is potential for significant wave action, due to moderate exposure, throughout most of this unit except for a few isolated places. This may reduce the potential of the area for off-bottom culture or require use of culture systems designed to withstand higher wave action.

Use Recommendations for Shellfish Aquaculture(based on acceptability) :

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
✓	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable**. The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Guidelines:

- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- Tenure applications for shellfish aquaculture in the Unit should be referred to the CWS.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

Unit 8 Squirrel Cove

Marine Area	1677 ha	**Shoreline**	48 km
Substrate	Hard	**Slope**	Sloping
Exposure	Low	**Depth**	Mid-Depth
Current	Low	**Benthic Summer Temp**	Warm
Roughness	Low		

Description:

Squirrel Cove is a protected harbour with high biological values and a diversity of uses, including recreation, tourism and shellfish culture. Fetches are limited to <15 km to the east and Squirrel Cove is very protected. Seabed sediments are primarily muddy sands and seabed relief is low to moderate. The Cove contains the main Klahoose First Nations reserve and a UREP (Notation of Interest). Water quality has been identified as an issue due to annual sanitary closures due to bacterial contamination which has been associated with boat traffic in the area during summer months.

Attributes:

- Unit faces east towards Desolation Sound and includes mostly coarse sediment beaches with interspersed bedrock cliffs.
- Nearshore Habitats: rocky shore and protected inlet.
- The approaches to Squirrel Cove and the islands within it are bedrock, but much of the cove shoreline is either sand flats or sand & gravel flats
- Squirrel Cove is reported to be very warm in the summer and the location of frequent plankton blooms
- CWS Area of Interest for Migratory birds: entire unit.
- Shellfish Beach capability: Good for oysters, scallops and clams at Squirrel Cove.
- Shellfish Deepwater capability: oysters and scallops rated Good to Moderate from Boulder Point and entrance of Squirrel Cove south to the end of the unit.
- Eelgrass beds (9 identified).
- Intertidal clam beaches: (6 identified).
- Documented salmon spawning stream; Basil (Store) Creek
- Area designated as a No Discharge Zone under Pleasure Craft Sewage Discharge Regulations.

Current Uses and Activities:

- Klahoose Indian Reserve: southwest shore of Squirrel Cove, western shore of lagoon entrance
- UREP: Squirrel Cove, excluding the lagoon.
- Shellfish aquaculture (7 beach tenures occupying 22.2 ha and one off-bottom tenure occupying 3 ha). This unit is the second most developed area for beach culture, after unit 4 (Marina Island).
- Beach northwest of Boulder Point identified as highly productive and used for commercial and recreational wild clam harvest (FOC and local knowledge).
- Campsites (2) (campsites could be provincial, regional or private or undeveloped kayak campsites)
- Marine telecommunications and utilities tenure (1) south end of unit extending from Tiber Bay
- Safe anchorages (4) one in Squirrel Cove, two immediately south of the entrance to Squirrel Cove and one at the south end of the unit.
- Unit lies within traditional territories of Klahoose and Homalco First Nations.

Issues and Concerns:

- Significant portions of Squirrel Cove are routinely closed by FOC to harvesting of shellfish from May 31 to September 15th each year. This is a major concern for the Klahoose First Nation. This significantly impacts their ability to optimize use of the existing tenures in this area. The Band is actively seeking ways to remediate water quality in this area as it is interested in further shellfish culture development as well as enhancement of wild stocks in this area.
- There is general support from the Klahoose Band and other residents for the construction of a sewage pump out station in Squirrel Cove to help remediate the water quality of the area. The Klahoose would like to conduct a feasibility study and business plan for a pump-out station as a necessary step to procure funding for station construction.
- Concern has been expressed by upland owners over the potential for beach culture applications on beaches immediately fronting private property on the understanding that beach culture tenures will preclude wild recreational harvesting. Upland owner consent is required for tenure applications immediately adjacent to private upland property, if the proposed use has the potential to impede riparian rights to access.
- A number of residents, including members of the Advisory Committee have stated that remaining beaches used for wild clam harvest should not be tenured for shellfish beach culture.
- Squirrel Cove is a major recreational boat use and anchorage area.

Use Recommendations for Shellfish Aquaculture (based on acceptability):

Tenure Recommendations	
✓	Shellfish Beach Aquaculture
✓	Shellfish Off-bottom Aquaculture
✓	Shellfish Sub-tidal Aquaculture

Code	
✓	**Acceptable**. The use is considered acceptable and appropriate. Applications for this use should be accepted for processing and evaluation. Acceptance of an application does not guarantee that a tenure will be approved.
O	**Conditionally Acceptable** The use is considered conditionally acceptable. New applications for this use should be accepted for processing and evaluation only if they meet the terms of relevant Management Conditions in the Plan.
X	**Not Acceptable**. The use is considered inappropriate. Applications for this use should not be accepted for processing and evaluation.

Management Guidelines:

- Remove *Land Act* UREP Notation of Interest over Squirrel Cove for recreation purposes in favour of WLAP.
- New tenures for beach culture should minimize interference with wild clam recreational and commercial harvesting.
- New tenures for sub-tidal culture should be located to minimize interference with wild sub-tidal shellfish fisheries.
- New tenures should avoid interference with navigation.
- New tenures should not impede access to safe anchorages in Squirrel Cove, just south of Squirrel Cove and at the south end of the unit.
- Information on locations of heritage and traditional resource use sites provided by First Nations will be considered in the review of any tenure applications.
- FOC has indicated that a *Fisheries Act* authorization would be required for FOC to approve development within an eelgrass bed.
- FOC has indicated that if sites adjacent to eelgrass beds are developed measures would have to be implemented to avoid negative impacts to the beds.

- Applicants should consider that Squirrel Cove is subject to seasonal contamination closures and as a result may not be suitable for development, unless water quality improves (Section 6.4 of this Plan describes a project to support water quality remediation in Squirrel Cove).
- Beach culture operators should avoid stream channeling that could result in habitat impacts and federal *Fisheries Act* violations.
- Beach culture operators should avoid vehicular use of intertidal areas and manage operations where necessary to avoid negative impacts on beach spawning finfish such as sand lance and smelt. See section 5.1 for information on sand lance and smelt spawning impacts.
- Tenure operators should undertake measures to avoid negative impacts of predator netting where the results of ecological studies or monitoring of predator netting effects in Baynes Sound, Barkley Sound and Malaspina Inlet area demonstrate unacceptable impacts.

4.0 Regulation of Shellfish Aquaculture

4.1 Agency Review and Regulatory Responsibility

The Ministry of Agriculture, Food and Fisheries (MAFF) is the lead agency for aquaculture development in BC. MAFF is responsible for licensing shellfish aquaculture under the *Fisheries Act* and aquaculture regulations, and for inspecting and ensuring compliance and enforcement of aquaculture licensing provisions and regulations. Through site investigations and field data collection, as well as detailed reviews of proposed Shellfish Aquaculture Management Plans, MAFF biologists assess the biophysical capability and technical feasibility of all aquaculture proposals prior to approval and licensing. Included in the aquaculture license is the approved Shellfish Aquaculture Management Plan which lists the species of culture, and the operating provisions for the tenure. The aquaculture license may also include a number of special provisions determined by site-specific circumstances.

The responsibilities of the Ministry of Water, Land and Air Protection (WLAP) include planning and managing of wildlife, recreational fisheries, as well as provincial parks and protected areas. WLAP reviews proposed shellfish aquaculture operations and then makes recommendations to other government agencies where aquaculture operations could affect the planning and management of the abovementioned land, water and resource base.

Land and Water BC Inc. (LWBC) is a special operating agency responsible for administering and enforcing provisions of the *Land Act* and *Water Act*. Under the *Land Act* most commercial activities taking place on Crown land (including the seabed) or in Crown waters require a tenure. All proposals for tenure go through an interagency referral process, which is coordinated by LWBC. The main agencies involved in the review process are MAFF, LWBC, and the Department of Fisheries and Oceans Canada (FOC).

Applications for any new tenure, tenure expansion, or alteration of an existing facility may require an environmental assessment under the *Canadian Environmental Assessment Act* if a *Navigable Waters Protection Act* permit is required. The Canadian Coast Guard (now an agency within FOC) reviews navigational safety requirements of proposals under the *Navigable Waters Protections Act*. The FOC and Coast Guard reviews are major determining factors in the approval of proposed projects. FOC reviews applications to assess the potential for negative impacts on fish and/ or fish habitat. The Canadian Coast Guard reviews applications to ensure that only sites in safe locations are permitted and that appropriate markers and navigational safety measures are implemented. The review process involves a number of existing technical siting and compatibility criteria (i.e. Decision Tools) that agencies use in assessing applications for shellfish aquaculture tenures (for criteria and agencies responsible, see Appendix 4).

Environment Canada (EC) is responsible for measuring water quality and documenting actual and potential pollution sources and making subsequent recommendations for the classification of shellfish growing waters (e.g. approved, closed, etc.).

The Canadian Food Inspection Agency (CFIA) is responsible for plant certification and the monitoring of paralytic shellfish poisoning (red tide levels) in marine waters.

Based on water quality information from Environment Canada and a review by the Classification Committee (EC, FOC, CFIA and WLAP), FOC imposes and enforces harvesting closures.

The Regional District of Comox Strathcona (RDCS) has the authority to regulate land use under the *Local Government Act* within its jurisdictional boundaries, which includes Cortes Island. It is anticipated that this will continue under the pending *Local Government Charter*. Land use planning and regulations can be affected through Official Community Plans (OCPs) and zoning bylaws, which enable the control of conditions such as the type of use, the density of activities (i.e. structures as well as coverage) and set backs (i.e. buffers). OCPs and zoning bylaws must go through a community review process prior to their approval. Noise and nuisance bylaws can be used to control activities that are disturbing within the community, and that are not classified "Normal Farm Practices" by the Farm Practices Board (now the BC Farm Industry Review Board) under the *Farm Practices Protection (Right to Farm) Act*. For information on the *Farm Practices Protection Act*, including licensed aquaculture regulations, see the following website: http://www.agf.gov.bc.ca/resmgmt/fppa/refguide/intro.htm

4.2 Enforceable Code of Practice

In the spring of 2002, the Province developed a draft Provincial Code of Practice (Standards of Operation) for Shellfish Aquaculture and subjected it to a public review through a consultation program in several coastal communities. Based on that review and additional agency analysis, the Province is now finalizing the Code which will be enforceable under the Aquaculture License for all shellfish farmers. Once the Code is implemented, it will have significant implications for Cortes Island and, in particular, Gorge Harbour. Information on the Code of Practice can be viewed at:http://www.agf.gov.bc.ca/fisheries/Shellfish/cop.htm - Final%20COP

http://www.agf.gov.bc.ca/fisheries/Shellfish/cop.htm#Final%20COP

4.3 Dispute Resolution and Assessment of Farm Practices

During the planning process it became evident that residents wanted more effective methods of dispute resolution within Gorge Harbour than they felt had been previously available. The Plan is designed to avoid or reduce future disputes related to resource use conflicts. Despite this Plan, some future disputes may be anticipated over the operation of specific aquaculture facilities. A dispute resolution process already exists (called "Complaint Resolution Process") under the *Farm Practices Protection (Right to Farm) Act* (FPPA), but it became apparent during the planning process that residents of Cortes Island were generally not well acquainted with the process or how to use it. To address this difficulty, a detailed description and a flowchart of the process is presented in Appendix 5.

It also became evident that there was a lack of clarity on what constitutes "Normal Farm Practices" allowable under the FPPA (for more detail on the FPPA go to the following website: http://www.agf.gov.bc.ca/resmgmt/fppa/refguide/intro.htm)
The main body created by the FPPA for overseeing disputes over aquaculture is the BC Farm Industry Review Board. The Board was originally established as the Farm Practices Board under the FPPA in 1996, and is responsible for providing a fair and equitable process for resolving farm practice disputes out of court. The FPPA prohibits nuisance lawsuits from being brought against operators of "Normal Farm Practices". The Board also addresses disputes related to the aquaculture industry by providing a non-litigious process for resolving conflicts between farm operators and their neighbours. The Board consists of up to 20 members who represent both farming and non-farming interests across the Province. The Board is responsible for making recommendations and resolving disputes as to whether aquaculture operations are using normal practices[1]. It should be noted that the BC Farm Industry Review Board only deals with disputes over "Normal Farm Practices", and not land use and allocation issues. Site-specific land-use and allocation issues are addressed by LWBC.
The Board encourages new and innovative technology, but indicates that as proposed operations grow in size and proximity to neighbours, the need increases for proponents to mitigate impacts of their operations on their neighbours. Depending on the site-specific circumstances, there may be some exceptions. This may necessitate a Board review of a specific activity and then a ruling on whether or not it is a "Normal Farm Practice". Since site-specific circumstances vary from one area to another, there is no clear list of what constitutes a "Normal Farm Practice" for aquaculture for every situation. Consequently, proponents should be proactive in planning their operations.

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[1] The fundamental policy of the FPPA is that farmers have a right to farm in BC's important farming areas, provided they use "Normal Farm Practices" and follow other legislation listed within the *Act*. The FPPA applies to all licensed commercial aquaculture operations in the Province. Under the FPPA "Normal Farm Practices" are those conducted by a farm business in a manner consistent with proper and accepted customs and standards as established and followed by similar farm business under similar circumstances. The BC Farm Industry Review Board is the authority for determining what is or is not a "Normal Farm Practice".

4.4 Compliance and Enforcement of Existing Operations in Gorge Harbour

During the development of the Baynes Sound Coastal Plan for Shellfish Aquaculture (2002), MAFF, MWLAP, MSRM and LWBC developed a provincial "Service Agreement on the Coordination of Compliance and Enforcement". The Agreement is available at:

www.agf.gov.bc.ca/fisheries/compl/service%20agreement2.pdf

The Agreement outlines the role of each agency regarding inspection and enforcement of aquaculture and provides the basis for coordinated inspection and enforcement services to be applied throughout the Province. Additionally, provincial regulatory agencies and the RDCS have also agreed to coordinate their own enforcement programs in striving to develop more efficient and effective ways of avoiding overlap in decision-making processes.

Prior to, and during, the Cortes planning process it has been evident that residents were dissatisfied with industry compliance and agency enforcement of regulations and bylaws within Gorge Harbour. In the summer of 2001 an aerial reconnaissance was conducted of Gorge Harbour. In the summer of 2002, MAFF fisheries inspectors completed an inspection program within the Harbour to determine the level of compliance by the local shellfish industry with government regulations and the Voluntary Code of Practice developed by the BC Shellfish Growers Association. Since then, MAFF has hired additional licensing and enforcement staff to meet increased requirements for compliance and enforcement of aquaculture regulations within the Province. Another Inspection program, as yet not completed, is underway for the summer 2003 field season. An investigation by WLAP concerning one operation was also commenced in the spring 2003, but separate from the planning process. The RDCS also has a role in inspection and enforcement as it applies to bylaws in the area, including the existing *Zoning Bylaw*. The aerial reconnaissance and inspections have indicated that non compliance with tenure documents or Shellfish Aquaculture Management Plans or RDCS zoning requirements is quite widespread. The agencies, including the Regional District, have been awaiting completion of the Plan before addressing these issues directly on the understanding that the Plan will provide guidance on appropriate areas for shellfish aquaculture. Unauthorized uses that are not consistent with the Plan will be managed by the appropriate agency. The RDCS intends to soon review the aquaculture provisions in its *Zoning Bylaw* upon completion of the Plan with the intent to revise those provisions. Some property owners of Gorge Harbour upland have been vocal in their dissatisfaction over agencies waiting until plan completion before addressing the compliance issue.

The issues identified for Gorge Harbour are listed below along with the agencies responsible for addressing these issues and the mechanisms available in order to accomplish that task. The agencies have committed to implementing a coordinated compliance and enforcement program within Gorge Harbour upon completion of the Plan:

1. **Unauthorized use of Crown land:** LWBC under the *Land Act*
2. **Riparian (*i.e.* water) access to private upland property:** LWBC under the *Land Act*
3. **Adherence to Shellfish Aquaculture Management Plan:** MAFF under provisions of the Aquaculture License and the Aquaculture Regulations
4. **Mechanical tumblers:** MAFF Aquaculture License; RDCS *Zoning*
5. **Existence and height of structures:** RDCS *Zoning*
6. **Setbacks:** RDCS *Zoning*
7. **Visual Impacts:** RDCS *Zoning* of structures; BC enforceable Shellfish Aquaculture Code of Practice
8. **Litter on Beach:** MAFF enforceable Shellfish Aquaculture Code of Practice
9. **Excessive Mechanization/Normal Farm Practices:** BC Farm Industry Review Board – Complaint Resolution Process under the FPPA
10. **Noise Impacts:** RDCS Noise Bylaw; BC enforceable Shellfish Aquaculture Code of Practice
11. **Odour:** BC enforceable Shellfish Aquaculture Code of Practice

Requirements under the Aquaculture License will include the Provincial Code of Practice, once it comes into force.

5.0 Environmental, Economic and Community Implications of the Plan

5.1 Environmental Implications of Recommendations

Risk Assessment

Most human activities have the potential to both positively and negatively affect the environment. Understanding the risk of a resource development activity such as shellfish culture is critical in deciding whether to allow, or how to manage, that activity. Risk can be determined only by evaluating both the significance of negative effects and the probability of their occurrence. In most cases, such as this Plan, the extensive data necessary for a mathematical calculation of probability and significance are not available. However, it is still possible to use science and relative (i.e. non-mathematical) risk assessment in an adaptive management context.

Figure 27. Water Sampling in Gorge Harbour (Brian Kingzett photo).

Resource managers commonly use the professional experience and judgement of experts to provide a relative assessment of an activity in terms of "high", "moderate" or "low" risk. If environmental risk is high (e.g. high significance, high probability), managers tend to be more conservative in their prescription of management or allocation measures. Where risk is low (i.e. low significance, low probability), management and allocation measures can be less conservative. Where risk is low to moderate managers often employ a tool called adaptive management which allows them to move forward with management and allocation decisions, but in a way that enables the effects of those decisions to be monitored, and then modified where necessary before a significant negative impact is likely to occur. That is the approach taken with the Cortes Plan.

Methodology

Resource managers commonly employ existing information available from one area to assess a proposed use in a new area. This is usually done where the proposed use is similar to that already studied in the first area and there is sufficient environmental information to understand the level of risk in both areas. Shellfish aquaculture practiced in the Plan Area is quite similar to that practiced in other areas of the province, such as Baynes Sound. During development of the Baynes Sound Coastal Plan for Shellfish Aquaculture (2002), a relative assessment was made of the potential effects of shellfish aquaculture by Archipelago Marine Research (Archipelago). That included a literature review specific to Baynes Sound but also included a review of international research on the environmental effects of shellfish aquaculture. Archipelago also consulted with scientists studying shellfish aquaculture impacts and then considered the potential effects of different shellfish culture activities in terms of severity, duration and extent prior to assigning a relative rating of low, moderate or high risk. Archipelago also identified areas where significant uncertainties existed. The Archipelago Report can be viewed at the following website: http://srmwww.gov.bc.ca/rmd/coastal/Planning/south_island/baynes/index.htm

The approach used by Archipelago and the resulting report were also subjected to review by two independent specialists in the field of marine biology, one a university professor and the other a marine biological consultant.

Based on the similarity of culture approaches between Cortes Island and Baynes Sound, along with a consideration of environmental factors specific to Cortes Island and additional information obtained or studies under way, the Archipelago assessment was applied to Cortes Island using the same risk ratings that were applied to Baynes Sound.

An environmental issue specific to Gorge Harbour has been the debate over its biological carrying capacity for shellfish aquaculture as well as cumulative effects. Culturing of shellfish places an increased demand on the food supply of a marine ecosystem. The carrying capacity of the BC coast for shellfish culture is considered to be generally high, given the temperate climate combined with coastal up-welling and estuarine conditions that recharge nutrients for phytoplankton production. However, in a few relatively restricted waterways that support significant shellfish production (e.g. Gorge Harbour, and Malaspina Inlet system, Lemmens Inlet and Baynes Sound), some uncertainty has existed regarding carrying capacity for shellfish culture, prompting area-specific research into this topic and related aspects of ocean circulation.

BC Shellfish Growers Association contracted a carrying capacity study of Gorge Harbour to address the debate over biological carrying capacity. The study was done by well-qualified scientists chosen for their expertise with oceanographic modeling and ability to conduct carrying capacity assessments. A scientist from MAFF was also involved with the study which was designed to address questions around the relatively high concentration of shellfish culture in that area compared to other areas of the BC coast. The study included oceanographic observations for Gorge Harbour and Strait of Georgia from September 11 to October 29, 2000. The study also included depth profiles of temperature, salinity, and chlorophyll-a at 18 sites, and current measurements and weather data. A major component involved development of an oceanographic model that was tested using field data from Gorge Harbour and shown to perform successfully. Sedimentation and food uptake experiments were also part of the study.

The study and follow-up field monitoring has spanned a number of years. The follow-up monitoring has been at a station established since July 2001, with regular monitoring (each two month period) of environmental conditions and oyster growth, survival and bio-fouling. A detailed report on the study can be found on the following website:

http://www.kingzett.bc.ca/projects/gorge2.htm

Following completion of the Baynes Sound Coastal Plan, MSRM contracted Archipelago Marine to conduct a study of beach spawning finfish in Baynes Sound to address uncertainties identified in the Baynes Sound Plan. The results of this study can also be extrapolated to Cortes Island where the same species spawn. The final draft of the Archipelago report on Pacific sand lance spawning habitat in Baynes Sound can be found at the following website:

http://srmwww.gov.bc.ca/rmd/coastal/south_island/baynes/index.htm

Additional Studies and Monitoring

A number of investigations are in planning, under way or completed to address the uncertainties mentioned above.

The province recognizes the need for a cumulative effects analysis in Gorge Harbour. Rather than assessing the potential effects of individual proposals in isolation, provincial staff are currently discussing ways to conduct a comprehensive review of all the tenure applications for Gorge Harbour together. This would provide a better perspective on the potential for impact on Gorge Harbour as a whole from all the applications. LWBC will be working with the industry to coordinate all the applications for expansions and one new application for First Nations so that they are received at approximately the same time. This will help to provide the information needed from the proponents for the comprehensive assessment and will also provide some efficiencies and cost savings in information collection.

Several major studies by Simon Fraser University and the Canadian Wildlife Service are currently underway on birds and shore zone ecosystems in Baynes Sound, Barkley Sound and the Malaspina Inlet. MAFF is working with the shellfish aquaculture industry in Baynes Sound to monitor the effects of new clam predator netting on birds, the results of which will determine further management actions there as well as in the Cortes Plan Area.

Local residents with oceanographic expertise have expressed concern that the biological carrying capacity study did not include an assessment of dissolved oxygen or sediment redox potential. These items are part of a broader spectrum of being environmental factors being addressed during a new study recently initiated by Malaspina University College on shellfish culture and particulate matter production and cycling. The study will include a core sampling exercise which is expected to assist in determining what has occurred in the Harbour over time.

Assessment Results

Based on the Archipelago report it can be concluded that most shellfish culture activities, if they were to occur, present a low to moderate risk to the environment in the Cortes Island area and that the significance of potential impacts from off-bottom culture is less than from beach culture. Exceptions to this would be stream channelling and vehicular use of intertidal areas which are addressed through management guidelines for the Cortes Island planning units. Although use of clam predator netting is likely to result in low to moderate negative impacts with short duration upon removal of netting, some uncertainty remains concerning the significance of these potential impacts. The planning unit management guidelines indicate that this may have to be managed, depending on the results of related studies and monitoring underway in other parts of the coast. However, given the reduced use of predator netting in the Plan Area and short duration of the negative impacts, where they may occur, the Plan does not restrict the use of predator netting.

The Archipelago report also indicated uncertainties regarding the timing and habitat requirements of beach spawning animals such as sand lance and smelt, but Archipelago's subsequent beach spawning study significantly reduced that uncertainty and indicated there is a low likelihood of coincidence with intertidal aquaculture and spawning habitat and, where they do coincide, management activities can be undertaken to avoid impact as indicated in the planning unit management guidelines.

The Archipelago report did not address sub-tidal shellfish culture. However, the activities associated with sub-tidal culture are essentially the same as for wild harvest, including the use of predator netting in some cases to avoid crab predation on cultured or wild enhanced stock. The impacts from wild sub-tidal fisheries have not been extensively studied, but stock assessment staff from FOC indicate that one study indicated either no, or minimal impact, and that knowledge of how the wild fishery is prosecuted would lead to the same conclusion.

The Archipelago review also indicated that a number of positive effects could occur from shellfish aquaculture. These include coastal stewardship, improved water quality and sediment productivity, improved sediment quality, predation refuges and structural habitat features.

The carrying capacity study found that in comparison with other sites in Desolation Sound and other areas in coastal BC, Gorge Harbour site ranks as one of the highest in terms of favourable conditions for oyster growth and oyster performance. Key findings of the study include:

1. Primary production of phytoplankton is presently higher within Gorge Harbour than the Strait of Georgia.
2. It is estimated that 1151 additional aquaculture rafts, beyond those rafts already there. With the existing 321 rafts the total estimated number of rafts that could be placed within Gorge Harbour would be about 1436 rafts before phytoplankton concentrations within the water body would be reduced to levels similar to those measured in the Strait of Georgia. This does not represent a target for this Plan.

The study also made several recommendations regarding ways to increase oyster production through site management and better siting of operations.

The Baynes Sound sand lance and smelt beach spawning survey found that in many cases the location of intertidal culture does not coincide with sand lance and smelt spawning habitat and this is likely to be the case for Cortes Island as well, given its relative proximity to Baynes Sound. Based on the sediment composition information from that study, data from similar studies in Puget Sound, and beach sediment characteristics in the Plan Area it should be possible to avoid negative impacts through appropriate management practices where beach spawning habitat does coincide with shellfish culture.

Based on the above assessment it is likely that most shellfish culture activities, if they were to occur, present a low to moderate risk to the environment for Cortes Island similar as is the case for Baynes Sound. Stream channelling and vehicular use would represent the same level of uncertainty for Cortes Island as for Baynes Sound. Although use of clam predator netting is likely to result in low to moderate negative impacts, with short duration upon removal of netting, some uncertainty still remains concerning the significance of these potential impacts.

Information from the SFU/CWS studies on predator netting effects, as well as the MAFF required monitoring program for new predator netting in Baynes Sound, is expected to yield information to address this uncertainty. Although, in the Case of Cortes, there is expected to be less use of predator netting compared to Baynes Sound, Management Guidelines have been provided in the Plan that are robust enough to account for results of the above mentioned studies and monitoring.

General information from the beach spawning survey for Baynes Sound can also be applied to Cortes Island, given its proximity to Cortes and related information from Puget Sound. In the case of Baynes Sound substrate type (generally found in the upper intertidal above most beach culture operations) and exposure were significant habitat determinants for beach spawners. Existing information on substrate type and exposure from Cortes shoreline mapping and individual site information can be used to identify areas where special care must be taken in the use of time windows for beach shellfish operations where required.

The significance of potential impacts from off-bottom culture is less than from beach culture.

There are some biological values that are important to consider in the siting of shellfish farms and these are accounted for during the tenure application review by provincial and federal agencies. For instance, FOC, which is referred tenure applications normally, requires a habitat assessment based on marine foreshore assessment guidelines, which it uses to assess the acceptability of the application from a habitat perspective. FOC also applies a number of standard mitigation guidelines in terms of setbacks from valued ecosystem components such as eelgrass beds. A number of siting and best management practice guidelines are also currently in use by review agencies (see Appendix 4: Decision Tools for Siting Shellfish Aquaculture).

It is important to note that the Archipelago review also outlined a number of positive effects from shellfish aquaculture that can also occur. These include coastal stewardship, improved water quality and sediment productivity, improved sediment quality, predation refuges and structural habitat features. For instance, in the case of Gorge Harbour and Squirrel Cove the existence of shellfish aquaculture helps to strengthen the rationale for the installation of a sewage pump-out station to reduce the potential for bacterial contamination.

Summary

In conclusion, the risk of environmental impacts is low to moderate for shellfish aquaculture activities. A number of guidelines already exist separate from this Plan to address habitat issues at the site-specific application stage; in addition, the cap on the number of rafts in the Harbour is substantially less than the number of rafts likely to reduce plankton productivity within the Harbour to levels outside of the Harbour an the Strait of Georgia. The determination of acceptable uses, management conditions and guidelines outlined in the Plan, including the cap of 557 rafts in Gorge Harbour, are in keeping with the adaptive management approach to allocating and managing shellfish aquaculture. The province is also pursuing an approach for cumulative effects assessment of tenure applications expected for Gorge Harbour. From an environmental perspective the Plan satisfies the Vision outlined in the Governance Principles for Sustainable Resource Management (See Appendix 1) as well as the associated principles, including: making justifiable decisions, informed by science based information and risk management.

5.2 Economic and Community Implications of Recommendations

Economic and Community Assessment

Maintenance of environmental integrity invariably comprises one out of many different human values in a community. However, in the context of sustainability, economic and community values are equally comparable in importance to environmental values for making resource allocation decisions. These economic and community values often diverge widely and may conflict with each other. Once having considered the needs to maintain environmental integrity, a social choice for compromise is often necessary to ensure a fair balance among the remaining community values.

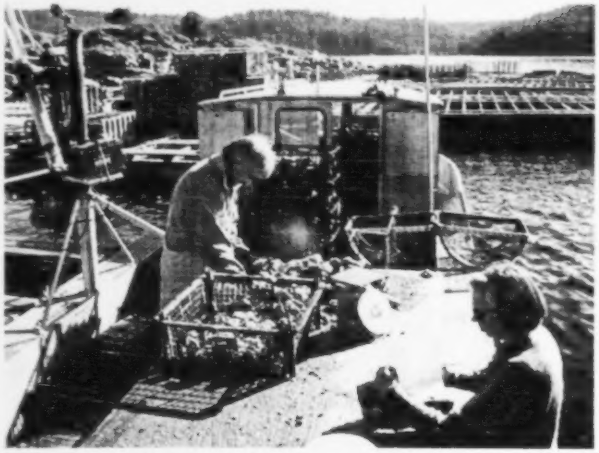

Figure 28. Oyster Raft Culture in Gorge Harbour (Brian Zingzett photo).

Methodology

Multiple Accounts Analysis has been used in the past by provincial planning agencies and Crown corporations to systematically document and evaluate impacts from different perspectives or "accounts", some monetary and others non-monetary.[4] The North Island Straits (NIS) Coastal Plan, completed in late 2002, included an attempt to conduct an abridged multiple accounts analysis (MAA) as a means to assess economic implications of that Plan's recommendations. In that case the multiple accounts evaluation proved very difficult because the Plan could not guarantee that an application for a particular use would be made or that applications would be approved and result in new tenured developments. The assessment of economic implications of the Cortes Island Coastal Plan is subject to the same economic assessment limitations as the NIS Plan, and, as was the case for NIS, relies largely on qualitative assessment for the majority of the Plan Area. For Gorge Harbour, some estimates of potential economic benefit can be made for off-bottom aquaculture using the cap on tenure expansion and new development identified in the Plan, based on estimates of jobs and income provided by local operators. The Plan does not quantify in detail the economic value of potential shellfish aquaculture development in units outside Gorge Harbour or of other existing uses in the Plan Area due to the confidentiality of some information and unavailability of other information. Section 2.3 does generally describe the economic value of the major sectors on Cortes. The Plan does take all affected uses into consideration and recognizes that there are both monetary and non-monetary values to fisheries, tourism, recreation, private land and shellfish aquaculture. These were generally taken into account in selecting a balanced compromise among shellfish culture and other interests in the Plan Area.

A list of the types of shellfish aquaculture is presented in Table 10, to illustrate the economic effects of the various types of shellfish culture contemplated by the Plan.

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[4] *From Social and Economic Impact Assessment for Land and Resource Management Planning in British Columbia: Draft Guidelines*, Integrated Resource Planning Committee, August, 2001. The guidelines for land and resource management Planning are currently being reviewed and updated.

Table 10. Comparative Economic Impact Coefficients for Shellfish Aquaculture Uses on Cortes Island.

Foreshore/ Nearshore Use	Capital Investment ($'000/site)	Annual Direct Jobs (Person Years (PYs)/site)	Annual Total Jobs (PYs/site)	Annual Income ($/PY)
Shellfish Beach Aquaculture	150	0.5	1.60	15 – 20,000
Shellfish Off-bottom Aquaculture	110	1.0/15 rafts	3.30	21,000
Shellfish Sub-tidal Aquaculture	-	0.3/ha	-	28,000

Source: North Island Straits Coastal Plan, MSRM, December 2002; Local operators; economic evaluation by Robinson Consulting and Associates Ltd.

Assessment Results

The Cortes Island Coastal Plan designates a shellfish aquaculture use as acceptable where no planning unit-specific conditions are required for tenure applications. Although not a multiple use Plan, the Cortes Plan also recognizes and supports other existing tenured uses and existing activities that are neither tenured nor managed by the Province (e.g. recreation activities) where they are known to occur.

Plan provisions apply only to potential tenure applications for new operations or expansion of existing operations. No applications for new tenures were in process prior to approval of this Plan, although a number of growers, primarily in Gorge Harbour, have expressed an interest in submitting applications for new tenure or expansion of existing tenures once the Plan is complete (see section 2.4).

Regarding potential new applications, alternative locations may have cost and profitability implications for planned and proposed uses which can have indirect employment, provincial revenue and community impacts. These impacts are not quantified due to their uncertain nature and a lack of readily available data.

The Plan will primarily affect future shellfish aquaculture development and related economic development and makes no recommendations regarding existing shellfish culture operations. However, provisions for future use were influenced, in part, by issues around existing operations.

The Plan may impose costs on certain shellfish aquaculture activities, particularly where uses are conditionally acceptable (e.g. outlining measures to avoid visual disturbance). However, since the Plan's main objective is to establish a general direction for dealing with applications, rather than changing specific siting criteria, it is unlikely that these costs would be significantly greater than under the current management regime.

Currently, there are 321 rafts in Gorge Harbour, after a reduction of 40 rafts by one operator. The cap imposed on Gorge Harbour provides for 146 additional rafts on three expanded existing tenures and within one existing tenure and 90 rafts on one new First Nations site (total 236). This represents a combined total of 557 new and existing rafts in Gorge Harbour at full development. Using current technology this would create about 16 new full-time jobs for off-bottom culture in Gorge Harbour and corresponding cumulative household income of about $340,000.00. This increased production could create about 12 additional jobs in supply and processing firms (mostly off Island).

An important point to note is that for the shellfish industry to be economically competitive, whether locally owned or not, there will be some requirement for mechanization. The key consideration is how to manage the operation and presentation of machinery in a way that minimizes the production of noise and visual disturbance to the public. Although the Provincial Code of Practice will address this to some degree, what level of mechanization might be acceptable specifically in Gorge Harbour requires further analysis and will be the subject of a project to be conducted during Plan implementation (see section 6.4).

In addition, the Cortes Island Coastal Plan has some indirect socio-economic benefits that result from coastal planning that cannot be quantified but can be stated in general qualitative terms. These include greater investor certainty and reduced capital and operating costs resulting from affirmation of existing shellfish aquaculture and clearer management direction for new shellfish aquaculture development, which should clarify the terms and conditions governing the siting approval process administered by LWBC.

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Economic benefits of the Plan are expected to accrue to both the Plan Area and to larger communities in the surrounding area. However, the proportion of new investment and employment opportunities that will accrue to communities and residents of the Plan Area depends on the local sourcing of labour and materials, supplies and equipment. Local sourcing depends on factors such as the type of shellfish aquaculture, the proximity of the development to communities in the Plan Area, local production capacity and the hiring policies of tenure holders.

The above discussion applies to both First Nation and non-First Nation communities. Unemployment rates among First Nations are typically much higher than for non-aboriginal population, and First Nations communities are much more reliant upon a mixed-subsistence economy which relies on marine food sources, particularly fisheries, to supplement household incomes or compensate for low incomes. First Nations view shellfish aquaculture opportunities as a way to significantly contribute to the economic sustainability of their communities. Aboriginal harvests of marine resources are likely to remain important parts of the Aboriginal income stream in the Plan Area. The Plan encourages increased involvement for the Plan Area First Nations in economic activities, while respecting traditional resource based uses and activities. If properly implemented, the Plan should have positive economic implications, for First Nations, and especially the Klahoose First Nation.

The Plan has provided an opportunity for one new off-bottom tenure application for First Nations because off-bottom sites are limited in the Plan Area, Gorge Harbour is within the Traditional Territory of both the Klahoose and Sliammon First Nations and Gorge Harbour represents one of the few remaining opportunities and good sites for off-bottom culture in the Plan Area.

There would be a potential for some costs from expanded and new shellfish tenures, if they were to preclude other activities or negatively affect other uses as stated by some concerned stakeholders (e.g. negative tourism impacts or reduced property values). There is also a potential for some social cost to upland owners, in Gorge Harbour particularly, given that any expansions or new development will involve some increased visual and noise disturbance. However, to address concerns raised by the Cortes Island community, the Plan seeks to maximize the potential for one new off-bottom tenure in Gorge Harbour where potential conflict is reduced, and to avoid locating a new tenure where the potential for conflict is high. The Plan also applies management conditions and guidelines to mitigate the potential for community impact from new development and expansion of existing operations throughout the Plan Area, including Gorge Harbour. As a result, incremental economic costs or social costs from new development are expected to be minimized as a result of the Plan.

There is significant interest and potential for additional beach culture outside of Gorge Harbour, in many cases on beaches used for commercial and recreational wild clam harvesting. Increasing interest is being shown by some commercial wild clam harvesters in shellfish aquaculture development and some wild harvesters are employed in the shellfish aquaculture industry. Many Cortes residents are concerned that new beach culture tenures around the Island would displace the wild harvest and have asked for the remaining wild beaches to be maintained for wild harvesting. Such displacement can occur and has occurred in the past on Cortes Island and other parts of the coast. This is because beach culture normally results in a much higher shellfish yield than wild harvesting due to the use of husbandry techniques. As a result, aquaculture offers the potential for significantly higher economic gain from the use of Crown land than a wild fishery and, as a result, is likely to offset the overall direct economic cost to the community from displacing a wild fishery.

The wild clam fishery has great cultural, economic and recreational importance to the Cortes Island community. The recreational component in some cases is linked to upland tourism opportunities and existing development and may have an indirect economic benefit to the tourism industry that is not easily quantified. A change of beach use from wild harvesting to shellfish culture may involve some individual economic impacts on those who rely on the commercial wild harvest as a way of life, but that impact may be offset to some degree by employment opportunities in the aquaculture industry, so long as those opportunities are similarly located. However, as enhanced tourism may be more compatible with wild harvest than with shellfish culture, as indicated by some tourism operators, some economic opportunities in the tourism sector may be forgone.

The Plan does not specify whether wild fisheries or shellfish culture should take precedence at specific sites although it does recognize that LWBC seeks the highest and best use for Crown land and this may involve consideration that shellfish production is often greater from beach culture than wild harvesting. The Plan has identified where the wild fishery is important, and in management guidelines has indicated that shellfish culture tenures should minimize interference with wild fisheries, but has left the decision on priority use to the site-specific application stage.

Summary

The Plan recognizes there will be economic and community benefits and costs resulting from increased shellfish aquaculture development. Many of the benefits and the majority of costs could be experienced in Gorge Harbour although benefits and social costs would not necessarily be restricted to the Harbour. The Plan has developed a number of provisions that will offset the economic and social costs by capping development in Gorge Harbour and identifying management conditions and guidelines throughout the Plan Area to minimize the costs while still providing some increased opportunities for community economic development through shellfish aquaculture. In the final analysis the Plan provisions resulted from efforts to remain within the limits of acceptable environmental risk as described in section 5.1 and a social choice for a balanced compromise among the needs of the shellfish aquaculture industry and other interests, including upland owners.

6.0 Plan Summary and Follow-up

6.1 Summary of Plan Recommendations

Table 11. Presented is a Summary of Recommendations Regarding Shellfish Aquaculture for the 8 Planning Units within the Plan Area.

Type of Shellfish Aquaculture	1. Cortes Island North	2. Sutil Channel	3. Carrington Bay	4. Marina Island	5. Gorge Harbour	6. Cortes Island South	7. Strait of Georgia	8. Squirrel Cove
Shellfish Beach Aquaculture	✓	✓	✓	✓	✓	O	✓	✓
Shellfish Off-bottom Aquaculture	✓	O	O	X	O	O	✓	✓
Shellfish Sub-tidal Aquaculture	✓	✓	✓	✓	✓	✓	✓	✓

Use Acceptability Code	
✓	**Use Acceptable**
O	**Use Conditionally Acceptable**
X	**Use Not Acceptable**

6.2 Summary of Recommendations for *Land Act* Notations of Interest

Four units contain recommendations for establishment, maintenance and/ or removal of *Land Act* Notations of Interest. A summary of these recommendations is provided in Table 12 below. In order for LWBC to place or maintain notations over these foreshore and nearshore areas, official letters of request will be required from WLAP and/ or CCG.

Table 12. Summary of Foreshore / Nearshore Areas Recommended for *Land Act* Notation of Interest (NOI)

Planning Unit	Specific Area	Purpose and Sponsoring Agency
Unit 1: Cortes Island North	Lewis Channel	Maintain (2) NOIs as tow boat reserves in favour of Council of Marine Carriers
Unit 4: Marina Island	Uganda Passage	Maintain *Land Act* Reserve for recreation purposes in favour of WLAP
	Marina Reef	Place NOI for conservation purposes in favour of WLAP
Unit 6: Cortes Island South	South of Cortes Bay	Maintain *Land Act* Reserve for recreation purposes in favour of WLAP
	Sutil Point Reef	Place NOI for conservation purposes in favour of WLAP
Unit 8: Squirrel Cove	Squirrel Cove	Removal of NOI for recreation purposes in favour of WLAP

6.3 Marine Conservation & Integrated Coastal Management

Three areas within the Cortes Island Planning Units are recommended as temporary Notations of Interest, for the express purpose of maintaining key marine conservation and recreation values. Future options for conservation and recreation management include one or combinations of such designation tools as: provincial marine parks or federal National Marine Conservation Areas; *Canada Oceans Act* Marine Protected Areas; fisheries closures; and permanent *Land Act* reserves.

DFO has recently initiated an integrated oceans management planning process, pursuant to the July 2002 *Canada Oceans Strategy* and its associated policy for integrated management of coastal and marine areas. The policy provides for mechanisms to address marine conservation and integrated management planning for marine ecosystems for both large and smaller oceans areas. Since the assessment and recommendation as to the most appropriate conservation or protection tools for individual areas is a joint federal and provincial responsibility, the areas recommended in the Plan (Table 13) should be jointly assessed during the next 12 – 24 month period, and recommendations as to the most appropriate management option identified. The outcomes will be reflected in the formal Cortes Island Coastal Plan review and amendment, scheduled in year three of the Plan's implementation.

6.4 Recommended Projects to Enhance Community and Environmental Sustainability

This Plan identifies potential opportunities provided by improved access to foreshore and nearshore for a several shellfish aquaculture uses. Table 13 provides details on two projects that should contribute to resolution of potential conflicts between recreational boating and shellfish aquaculture in Squirrel Cove.

Table 13. Recommended Project for the Cortes Island Plan Area

Affected Area	**Planning Unit 5 (Gorge Harbour)**
Participants & Product	• MSRM to fund project • Steering committee of MAFF (Chair), LWBC, MSRM, RDCS. • Project would include involvement by Shellfish Aquaculture Industry and Klahoose First Nation. • Report on an assessment of the acceptability of various levels of mechanization used for off-bottom culture operations in Gorge Harbour.
Time Frame	• Commence project by September 2003 • Complete report before January 2004.
Affected Area	**Planning Unit 8 (Squirrel Cove)**
Participants & Product	• MSRM to fund project • Steering committee of MSRM (Chair), WLAP, MAFF, Klahoose First Nation with involvement from RDCS. • Report that addresses feasibility and preliminary site analysis associated with construction and operation of a facility for marine vessel sewage pump-out.
Time Frame	• Commence project by September 2003 • Complete report before January 2004.

6.5 First Nations Considerations

The Province views participation by First Nations in shaping the Planning Unit recommendations within their traditional territories as an opportunity to share information with the Province about their interests in the Plan Area. Through such participation, the Plan is intended to foster improved working relationships, reduced impact of land use activities on First Nations activities, and greater participation of First Nations in economic development of resources.

The Plan continues to encourage all tenure applicants to develop working relationships with First Nations. Such working relationships could include:

- joint venturing or partnerships for development
- major First Nations involvement in operations
- training and employment of First Nations people in a development or tenure
- working with First Nations to identify and avoid areas of cultural and spiritual significance
- First Nations support in marketing of a development or business

Contact information for First Nations in the Plan Area can be found at:
http://www.gov.bc.ca/tno/negotiation/tribal_councils.Htm

6.6 Plan Review and Amendment

Three years from the anniversary date of Plan approval, the Ministry of Sustainable Resource Management (MSRM) will prepare an audit report on tenure applications and approvals that addresses the degree of compliance with the Plan. The audit will also consider additional information that is produced by research and monitoring projects that have been completed since completion of the Plan. A listing of interpretation issues and any public comments received during the three year period, as well as recommended plan amendments will be included in the report along with recommended actions or plan adjustments. The audit report will be presented to the standing interagency committee chaired by MSRM. The committee will use this report as the basis of a formal Plan review, which may lead to the redrafting and reaffirmation of the Plan by government. The process for redrafting or reaffirmation will include discussions with affected local government, First Nations, members of the planning advisory committee, and interest groups. Any revised or modified Plan will be posted on the MSRM website.

6.7 Summary of Follow-up Activities

Table 14. Summary Schedule of Follow-Up Activities

Sequence	Name of Activity	Initiation Date	Lead Responsibility
1	Accept, review and adjudicate shellfish aquaculture tenure and License applications as appropriate to planning unit provisions and management conditions	July 2003	LWBC/ MAFF
2	Initiate compliance and enforcement actions as appropriate for shellfish aquaculture and private moorage.	July 2003	LWBC/ MAFF/ WLAP
3	Official requests submitted from agencies for Notations of Interest	July 2003	WLAP/ CCG
4	Initiate feasibility study for sewage pump-out station in Squirrel Cove.	September 2003	MSRM/LWBC/MAFF/Klahoose First Nation
5	Initiate assessment of mechanization for Gorge Harbour	September 2003	MAFF/LWBC/MSRM/RDCS
6	Establish and remove notations and reserves	September 2003	LWBC
7	Initiate marine conservation assessments	January 2004	MSRM/ WLAP with DFO/ CWS/ Parks Canada
8	Accept application for one new First Nations off-bottom tenure in Gorge Harbour	Upon completion of activities 1 and 2	LWBC/MAFF

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Appendix 1. Governance Principles for Sustainable Resource Management

Vision

Sustainable resource management that optimizes economic development of the province's natural resources while protecting ecosystem integrity, enhancing community well being and ensuring an enduring legacy of prosperity for future generations.

Goals

A strong, competitive and vibrant provincial economy
A supportive social infrastructure
Safe, healthy communities and a sustainable environment
Sound Governance

Principles

Accountability: Enhancing performance management through effective compliance, enforcement, auditing and public reporting activities.

Certainty: Making timely and clear decisions within a predictable and understandable framework.

Competitiveness: Ensuring that British Columbia remains internationally competitive by removing barriers to investment and promoting open trade.

Continual improvement & innovation: Learning from the past, adapting to changing circumstances, encouraging innovation and being entrepreneurial.

Efficiency: Focussed and efficient delivery of government services and maximizing the net benefits arising from the allocation, development and use of natural resources.

Inclusion: Including the interests of First Nations, and their desire to participate more fully in the economy of the Province.

Innovation: Encouraging innovative approaches, technologies and skills to ensure the sustainability of natural resources.

Integration: Ensuring that decisions integrate economic, environmental and social elements, while considering the limits of each, for the benefit of present and future generations.

Science-based decision-making: Making justifiable decisions informed by science-based information and risk management.

Shared responsibility: Encouraging co-operation among First Nations; federal, provincial and local governments; academics; industry and non-governmental organizations in developing and implementing government policies.

Transparency: Establishing open and transparent decision-making processes that consider First Nations, the public and other key interests.

Appendix 2. VILUP Designation

SMZ-32: Quadra-Cortes

Location:	Northern tip of Quadra Island (outside of SMZ 19), Cortes, Read and Maurelle Islands
Total Area:	approximately 19,200 ha
Primary Values:	
Overall Management Guidance:	General Management Zone with significant recreation/visual and tourism values and immediate significance for biodiversity conservation; forest management practices should be adapted in design and scale to fit the nature, scale and sensitivities of the northern Gulf Island/southern Johnstone Strait environment
Description of Forest Values and Objectives	
Visual Resources:	Description : highly visually sensitive coastline Objective: General visual resource management with high emphasis on coastline
Tourism Resources:	Description: high values, levels of use and opportunities associated with coast/marine Objective: General Tourism Management
Fish:	Description: Anadromous values Objective: General Fish Management
Wildlife:	Description: lower to intermediate values associated with wetlands and coast/marine (marbled murrelet. Bald eagle, etc.) Objective: General Wildlife Management
Water:	Description: generally stable terrain, low equivalent clearcut area. Objective: General Watershed Management
Recreational Resources	Description: values associated with land/marine interface Objective: General Recreation Resource Management
Cultural Heritage Resources:	Objective: General Cultural Heritage Resource Management
Timber:	Description: lower to moderate productivity, almost entirely second growth timber Objective: General Timber Resource Management
Biodiversity:	Description: this zone is comprised by the Quadra draft landscape unit, which also encompasses the Quadra Special Management Zone, as well as the Cortes draft landscape unit; almost entirely CWHxm1 and xm2 which are regionally under represented; few remaining in old forests Objective: general biodiversity conservation
Cave/ Karst:	Objective: General Cave/ Karst Management
Non Forest	
Aquaculture	Description: Abundant areas of good potential for coastal finfish and shellfish culture, many existing operations Objective:
Mineral Resources	Description: High metallic mineral potential; moderate industrial mineral potential; some mineral tenures

Appendix 3. First Nations, Agency, and Interest Group Discussions

Table 14 Government, First Nations and Interest Groups Contacted in Plan Development

Group, Agency, Nation	Nature of Contact
First Nations, Regional Government, and Community	
Klahoose, Homalco and Sliammon First Nations and Hamatla Treaty Society	Invitations extended for participation in Plan process. Several staff meetings with Klahoose and Sliammon, one staff meeting with Hamatla Treaty Society.
Regional District of Comox Strathcona Staff and Regional Director	Several meetings
Cortes Coastal Plan Advisory Committee	Local meetings (5-6)
Industry	
BC Shellfish Growers Association	Meetings (2)
Area B Clam Harvesters	Meeting (1)
Tourism operators	Meetings (3); information exchange
Underwater Harvesters Association	Information exchange
BC Salmon Farmers Association	Information exchange
Marine Harvest Sea Farms	Information exchange
Fishing Vessel Owners Association	Meeting (1)
Cortes Island Shellfish Growers	Meeting (1)
Provincial and Federal Agencies	
Canadian Wildlife Service	Information exchange
Fisheries and Oceans Canada	Meeting (1); information exchange
Land & Water BC	Meetings; information exchange
Ministry of Forests	Information exchange
Ministry of Agriculture, Food & Fisheries	Meetings; information exchange
Ministry of Water, Land & Air Protection (Parks)	Information exchange
Non-Government Organizations	
Alliance for Responsible Shellfish Farming	Meetings (2); information exchange
Friends of Cortes Island	Meeting (1); information exchange
Council of BC Yacht Clubs	Meeting (1); information exchange
Coastal Tourism Operators Association	Meeting (1); information exchange
Tourism Comox Valley	Meeting(1); information exchange
General Public	
Individual stakeholders and residents	Many written (email) and verbal (telephone) communications and information exchanges

Appendix 4. Decision Tools for Accepting Shellfish Aquaculture Applications, and Guidelines for Siting and Best Management Practices

General Application Considerations Defined by the Plan

These considerations apply to applications for new tenures and expansion of existing tenures.

Beach, Off-bottom or Sub-tidal aquaculture are identified in a planning unit as **Acceptable** if tenure applications for those uses should be accepted by LWBC. In this case there would be no conditions for each application beyond routine agency application requirements for any shellfish culture application.

These uses are identified as **Conditionally Acceptable** if they are considered potentially compatible with existing values and resources in a planning unit, but LWBC would only consider accepting applications for tenure if conditions specific to that unit are fulfilled by the applicant, over and above conditions normally required for any tenure application. This may include submission of more specific information with a tenure application or specific siting requirements related to areas within the unit. Specific siting conditions or limitations developed before or after the Plan would also apply.

A use is initially identified as **Not Acceptable** if information and input determines there is an expectation of unacceptable conflicts with other resource uses of ecosystem values, or if the use is considered incompatible with adjacent upland designations.

Modifications

Any of the above initial determinations may be modified during Plan implementation based on changes in information and circumstances.

Guidelines for Technical Siting and Best Management Practices for Shellfish Aquaculture

Based on the provisions in this Plan proponents may choose to submit applications to LWBC for aquaculture tenure for various sites in the Plan Area. In cases where LWBC accepts applications, a number of siting guidelines developed independently from this Plan are applied during the application referral and review period. These are outlined in tables 4.1 and 4.2 below.

A Memorandum of Understanding (MOU) signed in 2001 by WLAP, MAFF other provincial agencies and LWBC (under its earlier title of BC Assets and Land Corporation (BCAL)) outlines guidelines for when LWBC should refer shellfish aquaculture tenure applications to WLAP (see Tables 4.1 and 4.2). The MOU also outlines a number of agreed upon guidelines for Shellfish Mariculture (i.e. shellfish aquaculture) best management practices (listed below Tables 4.1 and 4.2). Where no source is cited, management direction is considered to apply in all situations. The best management practices also apply generally.

Key:

A: Acceptable

M: Specific Management Provisions required to address interaction.

S: Siting Criteria established to address interaction

T: Timing window established to address activities/uses during critical periods

R: Criteria identified to trigger provincial interagency referral

NC: Not Compatible – no overlap permitted

Sources:

MOU: November 2001 MOU between BCAL (LWBC) and Provincial Referral Agencies

SMP: Provincial Shellfish Management Plan – MAFF/LWBC

Table 4.1: Use/Resource Compatibility and Referral Requirements: Shellfish Beach Aquaculture

Water Depth	
Salmon Stream (mouth)	S- Shellfish culture is not to be conducted within the braided channels of any salmonid creek. (SMP) T - Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP)
Clam/ Oyster Beach	R - No overlap, referral to WLAP required if application is within 100m (MOU)
Eelgrass Beds	NC: No overlap – 5m minimum (SMP) R: referral to WLAP required if application is within 100m. (MOU) S: Installation of any structures must not alter or disrupt eelgrass habitats (MOU,SMP)
Kelp Beds	NC - No gear and/or floating structures to be established over kelp bed habitats (SMP)
Rocky Reefs	NC - No gear and/or floating structures to be established over rocky reef habitats (SMP)
Estuaries/ Lagoons	R: Referral to WLAP required if application is within100m(MOU)
Salt Marshes and Mudflats	R: Where identified as a sensitive ecosystem, a WLAP referral is required for applications within 30m (MOU)
Seal/ Sea lion Haulout	R: Referral to WLAP required if application is within 500m (MOU)
Whale Feeding Areas or Migration Pathways	R: Referral to WLAP required if application is within 500m (MOU)
Eulachon Migration and Rearing	T - Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP)
Herring Spawning and Migration	T - Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP)
Waterfowl habitat	T - Where possible, aquaculture activity should take place during periods of low bird use (Both seasonal and diurnal) (MOU BMP)
Seabird Colonies	R: Referral to WLAP required if application is within 500m - Includes rafting and congregating areas as well as colonies (MOU)
Wildlife Trees/ Heronries	R: Referral to WLAP required if application is within 100m (MOU)
Invertebrate Habitat	R: Where identified as a sensitive ecosystem, a provincial tenure is required for applications within 30m (MOU)
Red/ Blue Species	M – species specific considerations
Parks, Ecological Reserves, Marine Protected Areas	NC
Areas of significant heritage or cultural value	To be addressed through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations

Table 4.2: Use/Resource Compatibility and Referral Requirements: Shellfish Off-bottom or Sub-tidal* Aquaculture

Water Depth	
Salmon Stream (mouth)	S - Shellfish culture is not to be conducted within the braided channels of any salmonid creek. (SMP) T - Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP)
Clam/ Oyster Beach	R - No overlap. Referral to WLAP required if application is within 100m (MOU)
Eelgrass Beds	NC - No overlap – 5m minimum buffer(SMP) R: Referral to WLAP required if application is within 100m. (MOU) S: Installation of any structures must not alter or disrupt eelgrass habitats (MOU, SMP)
Kelp Beds	NC - No gear and/or floating structures to be established over kelp bed habitats (SMP)
Rocky Reefs	NC - No gear and/or floating structures to be established over rocky reef habitats (SMP)
Estuaries/ Lagoons	R: Referral to WLAP required if application is within 100m (MOU)
Salt Marshes and Mudflats	R: Where identified as a sensitive ecosystem, a WLAP referral is required for applications within 30m (MOU)
Seal/ Sea lion Haulout	R: Referral to WLAP required if application is within 500m (MOU)
Whale Feeding Areas or Migration Pathways	R: Referral to WLAP required if application is within 500m (MOU)
Eulachon Migration and Rearing	T - Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP)
Herring Spawning and Migration	T Activities are to be timed to minimize impacts on Plants and animals (e.g. avoiding main spawning windows) (SMP) M – Herring spawn on long lines be left until eggs hatch and larvae emerge (SMP)
Waterfowl habitat	M – Long line netting (where used) should extend a minimum of 20m below the surface of the water to minimize conflict with diving ducks. (MOU BMP)
Seabird Colonies	R: Referral to WLAP required if application is within 500m Includes rafting and congregating areas as well as colonies (MOU)
Wildlife Trees/ Heronries	R: Referral to WLAP required if application is within 100m (MOU)
Invertebrate Habitat	R: Where identified as a sensitive ecosystem, a provincial tenure is required for applications within 30m (MOU)
Red/ Blue Species	M: species specific considerations
Parks, Ecological Reserves, Marine Protected Areas	NC
Areas of significant heritage or cultural value	R: Address through referrals to MSRM: Archaeology and Registry Services Branch and affected First Nations

* In the case of sub-tidal culture, some of these guidelines may not apply, given that the activity is conducted with no surface structures, in deeper water and sometimes well away from intertidal and shoreline activities and biological values.

Best Management Practices for Shellfish Mariculture (outlined in MOU)

- Netting against predation should be firmly anchored to the substrate and not permitted to float with rising tides. Mesh size should be sufficiently small to prevent entanglement, but not so small as to eliminate feeding through the mesh.
- Used netting, bags and other materials used in shellfish cultivation should not to be permitted to accumulate on or adjacent to tenure but to be disposed of in acceptable location.
- Accumulation of shell (beach culture) beyond that necessary for successful "catch" of spat should not take place.
- Long lines netting (where used) should extend a minimum of 20 metres below the surface of water to minimize conflict with diving ducks.
- Uncultivated or harvested "leave strips" should be incorporated within the design of beach culture tenures to minimize overall impacts on shore birds. These leave strips should cover at least 30% of the Tenure Area at any given time.
- Where possible, aquacultural activity should take place during periods of low bird use. (Both seasonal and diurnal).
- Structures which may alter natural beach processes (groynes, breakwaters) should not be employed.
- Vehicular use of the foreshore to access tenure sites should not be permitted.

Appendix 5. Dispute Resolution Process

Dispute Resolution Options (see flow chart below)

If an individual has site-specific concerns regarding noise, aesthetics, or other disturbances arising from a shellfish aquaculture operation it is recommended that she/he consider pursuing the following three options in sequence for dispute resolution. The following discussion makes reference to "complaint" and "complainants". No pejorative connotation is intended with this terminology. It is used to be consistent with language in the *Farm Practices Protection (Right to Farm) Act* and the Farm Practices Board Formal Complaint Process.

Option 1.

Initially contact the operator to discuss the concerns. In many cases, the operator may be able to explain the nature of the operation and/or resolve the concern at this local level.

Option 2.

If the person has talked to the aquaculture operator and has not been able to resolve the concern, or, if the complainant feels uncomfortable communicating with the shellfish operator directly, he/she may contact Aquaculture Licensing and Compliance Branch staff at MAFF. All complaints received concerning possible legislative, regulatory or license violations will be logged and a case file initiated by a MAFF Fisheries Inspector to assess the validity of the complaint. Depending on the outcome of the case file, appropriate enforcement sanctions may apply. Referrals to appropriate regulatory agencies, such as the Fisheries and Oceans Canada, the Ministry of Water, Land and Air Protection and LWBC will also be conducted by MAFF Inspectors, depending on the Inspector's findings. Complainants can contact 1-250-897-7540 to register their complaint.

MAFF staff will endeavour to develop a timely and reasonable resolution to a concern. Often peer advisors - aquaculture operators familiar with the farm practices in question - play an important role in such a resolution.

Option 3.

If the concerned party does not wish to approach the aquaculture operator directly or contact Licensing and Compliance staff at MAFF, they can file a complaint directly with the. The BC Farm Industry Review Board. The full process is pictured in a flowchart and outlined in detail in 2.0 below. The Board will undertake an initial investigation by contacting all the interested parties and give the complainant the opportunity to be heard. The Board then has a number of options:

a. The Board can "refuse" the complaint if it considers it trivial, frivolous, vexatious or not made in good faith.

b. The Board can, if it is acceptable to all the parties, adjourn the matter to the informal MAFF "concerns" process.

c. The Board can use a formal "settlement" process that may include MAFF, peer advisors and/or a mediator. The FPB oversees this process.

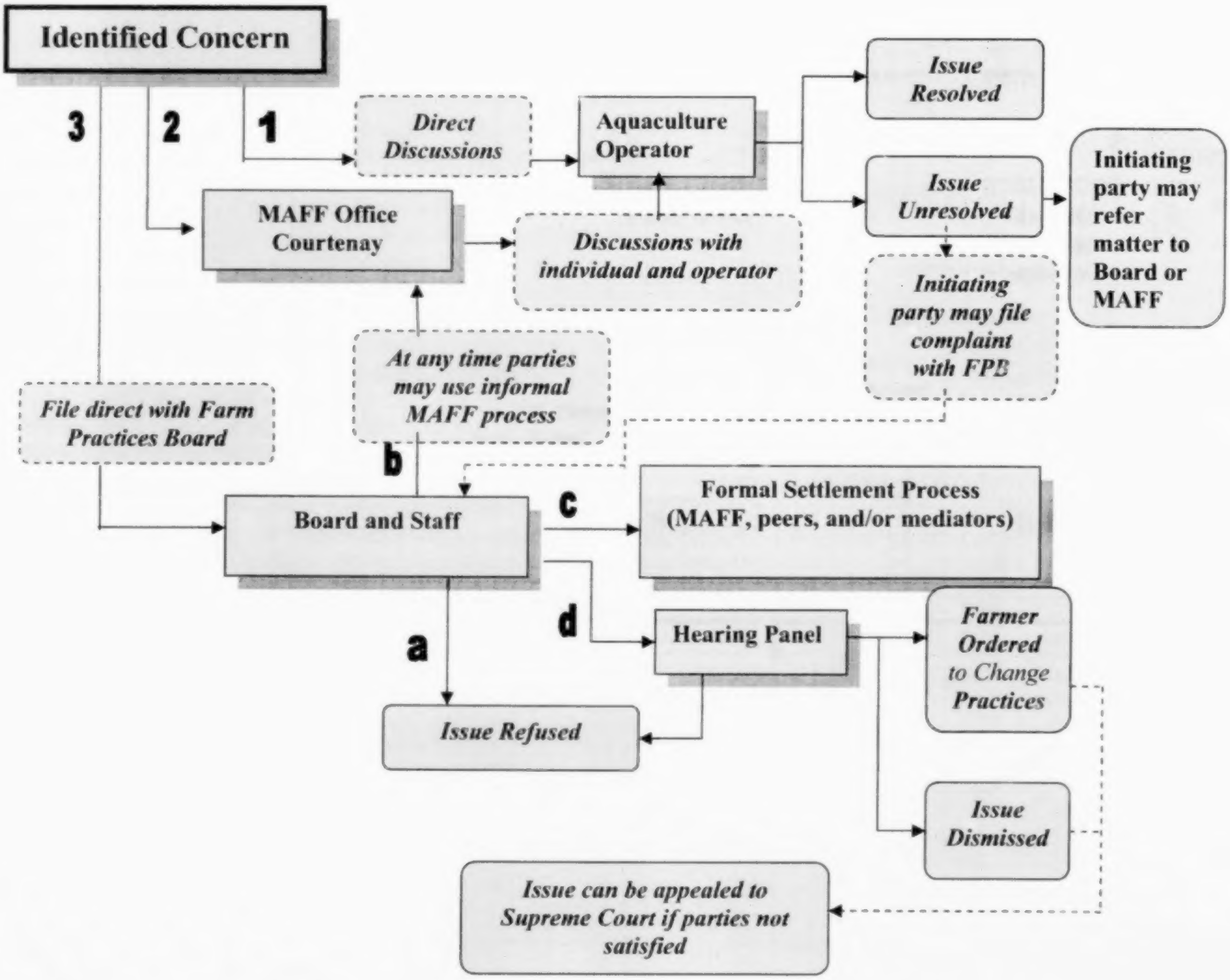
d. The Board can convene a hearing. The hearing panel must either dismiss the complaint or order the farmer to cease or modify the practice in question. The panel may also refuse the complaint for the same reasons as in "a" above. FPB decisions can be appealed to the Supreme Court on an issue of law or jurisdiction.

Contacts for Ministry of Agriculture, Food and Fisheries and the Farm Practices Board:

BC Farm Industry Review Board (Formerly, Farm Practices Board), Attention Jim Collins
3rd floor, 1007 Fort St.
PO Box 9129 STN PROV GOVT
Victoria, V8W 9B5
250-356-1677

MAFF
Aquaculture Licensing and Compliance Branch
2500 Cliffe Avenue
Courtenay, BC, V9N 5M6
250-897-7540

Dispute Resolution Process


Identified Concern
3
2
1
Direct Discussions
Aquaculture Operator
Issue Resolved
Issue Unresolved
Initiating party may refer matter to Board or MAFF
MAFF Office Courtenay
Discussions with individual and operator
Initiating party may file complaint with FPB
At any time parties may use informal MAFF process
File direct with Farm Practices Board
b
Board and Staff
c
Formal Settlement Process (MAFF, peers, and/or mediators)
d
a
Hearing Panel
Farmer Ordered to Change Practices
Issue Refused
Issue Dismissed
Issue can be appealed to Supreme Court if parties not satisfied

BC Farm Industry Review Board Formal Complaint Process (Revised September 5, 2000)

Steps/Action

1. A potential complainant contacts the BC Farm Industry Review Board (Board) prior to filing an official complaint. Board staff will informally discuss the nature of the complaint with the complainant and explain the formal complaint process under the legislation. If the person does not wish to file an official complaint, they will be redirected to the MAFF (MAFF) office nearest to them for information on MAFF's informal 'concerns' process. No further Board action will normally be taken unless a formal complaint is filed.

2. An official complaint is filed. **It must be in writing and have information regarding the nature of the complaint, the name and address of the complainant, the name and address of the farmer and the location of the farm. It must also be accompanied by a non-refundable filing fee of $100.00.** The normal extent of MAFF staff involvement in the filing of a formal complaint (if the informal process has failed or a person does not wish to use it) would be to provide the potential complainant with the preceding information and the Board's address and telephone number.

3. Board staff will acknowledge receipt of the complaint and send a letter to the complainant and the farmer explaining the complaints process in detail. Staff's letter to the farmer will also enclose a copy of the written notice of complaint and any supporting documentation the complainant provided with the notice.

4. In most cases, following the receipt of a complaint, a member and staff representative of the Board will visit the complainant and the farmer at the location of the complaint. This informal visit will be used to establish expeditious and effective communication with the parties, to ensure that the Board process is understood and to assist the Board staff in preparing for Steps #5 and #6. The member will not serve on any Board panel that may eventually hear the complaint and details of the visit will not, without the agreement of the parties, be communicated to the hearing panel.

5. In consultation with the parties, Board staff will commence assembling background information and identifying any other 'interested parties' that might become involved. Normally, Board staff will contact the appropriate MAFF, or other external agency, office as part of this background investigation.

6. Board staff will make initial recommendations to the Board chair regarding the best approach, or combination of approaches (see Steps #7-11) to handle the complaint. The chair will then issue the appropriate direction(s). Usually, this direction will include the establishment of a hearing panel regardless of whether the complaint will be proceeding directly to a hearing.

7. If deemed appropriate, and before appointing a panel, the chair may seek to determine whether the complaint should be referred to a panel for the purposes of a hearing. After giving the complainant an opportunity to be heard on the issue, the chair will decide whether the subject matter of the application is trivial, the application is frivolous, vexatious or is not made in good faith, or whether the complainant has a sufficient personal interest in the subject matter of the application. If so, the chair may **'refuse'** the complaint.

8. If acceptable to all parties, the complaint may be adjourned in order for the parties to participate in the MAFF 'concerns' process. The Board would not be directly involved pending a successful resolution, or the failure to achieve one.

9. If Step #8 is not used, the formal 'settlement' process may be utilized. This may include MAFF, peer advisors, and/or a mediator (all **"knowledgeable persons"**). This is similar to Step #8, except that the Board maintains an active and direct management of the process.

10. A pre-hearing conference is held. This will occur if the settlement process is not used, or if it fails. This is a formal process, conducted in person or by telephone, to confirm the issues and parties involved, to identify the background information required and to set the date, time, location and procedures for the hearing.

11. A hearing is conducted. This will be done on a date and in a location suitable to all parties. Although a standard hearing process is employed, the formality and type of hearing (which may include a tour of the farm) will vary depending on the issues and parties involved.

    After a hearing has begun, the panel may **'refuse'** the complaint for the same reasons as the chair might in Step #7.

    At any time **before a panel decision is issued,** the complaint can return to (or commence) the settlement process in order to attempt a resolution not requiring an Board decision.

12. A decision is issued by the Board panel. **The Board must dismiss the complaint or order the farmer to cease or modify the practice in question.** Once the written 'reasons for decision' are issued, the Board's role in the complaint is essentially terminated. A copy of the FPB's decision will be forwarded to the MAFF office of primary interest, upon request.

13. A party to the appeal has 60 days in which to appeal the Board's decision to the Supreme Court of British Columbia on a question of law or jurisdiction.

    If the farmer does not comply with the decision of the Board, a court may order the farmer to comply, the farmer may be subject to contempt proceedings and he or she will be open to nuisance and other actions initiated in the courts or at the Local government level.

    In certain cases, the Board may follow up with post-decision comments and/or recommendations regarding larger issues that may have been identified during the resolution of a complaint.

Appendix 6. References (includes website addresses)

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Air Temperature and Rainfall

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Tides and Currents

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Wave Exposure and Shore Type

Draft MSRM Shorezone Dataset

Eelgrass

Draft MSRM Shorezone Dataset and mapped local information, provided, courtesy, Friends of Cortes Island

Salt March Communities

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Nereocystis (Bull Kelp Beds)

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Prawns, Shrimp and Dungeness Crab

Laurie Chambers, Sunshine Seafoods, Lund
A. Belamar Lisenced Prawn Fisher, Cortes Island, BC

Herring Spawning

DFO Herring Spawn Geographic Database
http://www.pac.dfo-mpo.gc.ca/sci/herring/bulletin.htm

Salmon Spawning Streams

DFO/BC MWALP Fish Wizard Database http://pisces.env.gov.bc.ca/FishWizardFrames.asp

Seal and Sea Lion Haulouts

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